GILBARCO VEEDER-ROOT

Encore®

Installation Manual

MDE-3985N

Computer Programs and Documentation

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This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Approvals

Gilbarco is an ISO 9001:2000 registered company.

Underwriters Laboratories (UL):

U L File#	Products listed with U L
MH1941	All Gilbarco pumps and dispensers that bear the UL listing mark.
MH8467	Transac System 1000 and PAM 1000
E105106	Dell DHM Minitower
E165027	G-SITE and Passport Systems

New York City Fire Department (NYFD):

NYFD C of A #	Product
4805	The Advantage Series and Legacy Series
4986	Encore and Eclipse

California Air Resources Board (CARB):

Executive Order #	Product
G-70-52-AM	Balance Vapor Recovery
G-70-150-AE	VaporVac

National Conference of Weights and Measures (NCWM) - Certificate of Conformance (CoC):

Gilbarco pumps and dispensers are evaluated by NCWM under the National Type Evaluation Program (NTEP). NCWM has issued the following CoC:

CoC#	Product	Model #
02-019	Encore	Nxx
02-020	Eclipse	Exx
02-021	T-12C Console	PA0188, RA0188
	T-12C Console	PA0203, RA0203
02-022	T-12G Console	PA0180, RA0180
02-023	T-15 Console	PA0189
	T-15 Controller C2	PA0211
	T-15 Controller	PA0190
02-024	ProBlender	AU, RAU
	Precision Blender	AE, RAE
	Dispenser - Standard	AK, RAK
	Dispenser - Low Profile	AL, RAL
	Fixed Blender	AP, RAF
02-025	Meter - C Series	PA024NC10
	Meter - C Series	PA024TC10
	Salesmaker ProBlender	AB, RAB
99-165	Salesmaker Series 2/2H/4/4A	AM
02-026	H111B Series	AC, RAC
02-027	MPD-1 Series	AN, RAN
	Fixed Blender	AF, RAF, AG, RAG
	Dispenser - Low Profile	AR, RAR
02-028	Indoor Card	Q11640
	Outdoor Card	Q11891
02-029	CRIND	—
02-030	TS-1000 Console	PA0240
	TS-1000 Controller	PA0241
	Distribution Box	PA0242
	Micro-T Console	PA0250
	Meter - EC Series	PA024EC10
	VaporVac Kits	CV
02-031	The Advantage Series	Bxx, RBxx
02-032	Trimline Series	AA, RAA
02-033	Meter - C Series	PA024XC10
	MPD-A3 Series	AD, RAD
02-034	External Mount CRIND	CECXXXXXXX
02-035	Dimension	Dxx
02-036	Legacy	Jxxx
02-037	G-SITE Printer (Epson)	PA0307
	G-SITE Distribution Box	PA0306
	G-SITE Keyboard	PA0304
	G-SITE Mini Tower	PA0301
	G-SITE Monitor	PA0303
	G-SITE Printer (Citizen)	PA0308
02-038	C+ Meter	T19976
02-039	Passport	PA0324
02-040	Ecometer	T20453

Patents

Gilbarco Inc. products are manufactured or sold under one or more of the following US patents:

Dispensers

4,566,504 4,556,927 4,570,686 4,687,033 4,728,788 4,748,846 4,799,940 4,805,453 4,876,653 4,890,210 4,913,813 4,930,655 4,934,565 4,938,054
4,938,251 4,939,730 4,967,366 4,986,445 5,040,577 5,098,179 5,134,548 5,156,199 5,269,353 5,228,084 5,325,706 5,345,979 5,355,915 5,363,988
5,384,850 5,407,115 5,417,256 5,448,638 5,450,883 5,464,466 5,501,246 5,535,130 5,542,458 5,543,849 5,546,981 5,557,084 5,571,310 5,602,745
5,626,649 5,630,528 5,708,580 5,719,779 5,719,781 5,720,325 5,724,067 5,734,851 5,755,854 5,782,275 5,794,667 5,798,931 5,803,136 5,843,212
5,857,500 5,868,179 5,871,651 5,890,520 5,954,080 5,956,259 5,969,691 5,971,042 5,979,705 5,980,090 6,026,866 6,052,629 6,073,840 6,078,888
6,078,896 6,082,415 6,085,775 6,087,954 6,089,284 6,092,410 6,098,879 6,102,085 6,109,477 6,112,134 6,113,039 6,116,505 6,119,110 6,123,118
6,149,033 6,167,923 6,176,421 6,184,846 6,185,307 6,185,893 6,196,065 6,227,227 6,244,310 6,250,151 6,253,779 6,263,319 6,275,746 6,296,148
6,302,165 6,313,737 6,325,112 6,326,934 6,336,479 6,338,369 6,347,649 6,352,176 6,357,493 6,360,137 6,363,299 6,364,206 6,380,853 6,381,514
6,386,246 6,418,983 6,421,616 6,422,464 6,431,226 6,438,452 6,460,579 6,463,389 6,466,842 6,470,233 6,493,440 6,499,516 6,505,134 6,522,947
6,523,744 6,529,800 6,532,999 6,535,726 6,546,882 6,571,151 6,571,201 6,573,884 6,574,603 6,578,145 6,618,362 6,644,360 6,681,814 6,685,089
6,690,275 6,697,705 6,704,774 6,708,797 6,710,701 6,712,101 6,721,669 6,736,313 6,741,909 6,745,104 6,761,190 6,763,974 6,766,949 RE35,238
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D457,084

Point of Sale/Back Office Equipment

4,967,366 5,228,084 5,448,638 5,798,931 5,980,090 5,708,580 5,719,779 5,719,781 5,724,067 5,734,851 6,073,840 6,078,888 6,116,505 6,185,307
6,263,319 6,275,746 6,326,934 6,360,137 6,363,299 6,364,206

Trademarks

Non-registered trademarks

CIM™	G-SITE® Lite™	Applause™ Media System
C-PAM™	MultiLine™	SMART Meter™
ECR™	Highline™	SmartPad™
EMC™	Optimum™ Series	Surge Management System™
G-CAT™	PAM™ 1000	Tank Monitor™
Gilbert™	PAM™	TCR™
G-Poll™ Interface	SMART Connect™	Ultra-Hi™
G-SITE® Link™	SMART CRIND™	ValueLine™

Registered trademarks

CRIND®	InfoScreen®	Transac®
Dimension® Series	Legacy®	Transac® System 1000
e-CRIND®	Making Things Better®	Trimline®
Eclipse®	MPD®	TRIND®
Encore®	Passport®	VaporVac®
G-SITE®	Performer®	
Gilbarco®	The Advantage® Series	

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1 – Introduction

Purpose

This manual contains step-by-step instructions for installing Gilbarco® Encore® Series pumps and dispensers, including the "S" Series units. Installation of these pumps as a group is similar except for some differences in field wiring, calibration and hydraulic connections. This manual does not include site preparation instructions (refer to MDE-3802 Encore and Eclipse® Site Preparation Manual for site preparation instructions). After the installation is complete, a Gilbarco Authorized Service Contractor (ASC) must commission the unit to activate the warranty. Reference information to complete MDE-4226 Encore/Eclipse Installation Checklist is provided in this manual. Proper completion of the checklists is required for commissioning of the unit. Refer to "Installation Checklists" on page 16.

Related Documents

Document Number	Title	GOLD Library
FE-321	Field Wiring Diagram Gilbarco STP Isolation Relay Box PA0287 120 VAC	Engineering Diagrams
FE-353	Field Wiring Diagram Encore 550 Dispensers (All products)	Encore and Eclipse
FE-363	Field Wiring Diagram Encore 500 (All products)	Encore and Eclipse
FE-364	Field Wiring Diagram Encore 300 (All products)	Encore and Eclipse
MDE-2183	Domestic Warranty	Domestic Warranty and Owner's Manuals
MDE-3019	Handbook 44 (reference by Department of Weights and Measures)	N/A
MDE-3802	Encore and Eclipse Site Preparation Manual	Encore and Eclipse
MDE-3804	Encore and Eclipse Start-up/Service Manual	Encore and Eclipse Service Manual
MDE-3893	Encore/Eclipse Series Owner's Manual	Encore and Eclipse
MDE-4084	Junction Box Retrofit Kit M01483K006 Installation Manual	Encore and Eclipse
MDE-4166	Encore Island Adapter Kit M03064K001 Installation	Encore and Eclipse
MDE-4226	Encore/Eclipse Installation Checklist (Form A)	Encore and Eclipse
MDE-4227	Encore/Eclipse Start-up Checklist (Form B)	Encore and Eclipse
MDE-4228	Encore/Eclipse Commissioning Checklist (Form C)	Encore and Eclipse
MDE-4473	Encore Water Intrusion Prevention Kit	Encore and Eclipse
MDE-4699	SMART Connect™/Applause™ Media System Installation, Service and Parts Manual	SMART Connect Applause Media System
PT-1936	Encore Series Pump and Dispenser Illustrated Parts Manual	Encore and Eclipse Parts Manual
PT-1937	Encore and Eclipse Series Recommended Spare Parts Manual	Encore and Eclipse Parts Manual

Balance ISD Flowmeter Option

Refer to Veeder-Root® documents MSR 08.10.A and MSR 08.04.A for details regarding the requirements for Balanced ISD Flowmeter upgrades to your site.

*Note: This option is not available with suction units. **ADDITIONAL** site-specific equipment NEEDED to meet **ALL** ISD requirements is available from Veeder-Root (1-800-873-3313).*

Encore Shipping Weight and Model Codes: N-X-X

Shipping Weights

The shipping weight for a standard Encore dispenser is approximately 800 lbs. (363 kg). Additional shipping weight is added when options are included. The following table provides shipping weights for the dispenser and applicable option(s).

Equipment	Weight (lbs.)	Weight (kg)
Dispenser	850 lbs.	386 kg
Ultra-Hi™ (dual)	730 lbs.	331 kg
VaporVac® option	200 lbs. additional	91 kg additional
Pumping Unit option	60 lbs. per grade	27 kg per grade

Model Codes

While new models have their serial number and model plate located inside the Electronics Cabinet, in older units, they are located at the bottom of the dispenser directly above the serial number. The model number is a two letter and one numeric digit model code stamped onto the Model/Serial plate. This code shows the configuration of the Encore unit.
For example, a serial plate stamp with model code “NG2” signifies that the unit is an Encore Single-hose 3-grade Pump where:

N = represents an Encore unit
G = represents a single-hose
2 = represents a 3-grade Pump + 1

Refer to the following tables to determine the model code on a Gilbarco dispenser.

Note: Not all model types are available in an E500/500 S or E300 Series.

Encore 300, 500/550, and Encore S Series

N	X	X
Encore	**A** = Multi-hose Dispenser	**0** = 1-grade **1** = 2-grade **2** = 3-grade **3** = 4-grade
	C = Multi-hose Pump	**0** = 1-grade **1** = 2-grade **2** = 3-grade **3** = 4-grade
	G = Single-hose	**0** = 3-grade Dispenser **1** = 3-grade + 1 Dispenser **2** = 3-grade Pump **3** = 3-grade Pump + 1 **4** = 2-grade Single-hose Multi-Product Dispenser (MPD®) **5** = 2-grade Single-hose Pump
	J = Multi-hose Blender	**0** = 3-grade Blender Dispenser **1** = 3-grade Blender Pump **2** = 4-grade Blender + 1 Dispenser **3** = 4-grade Blender + 1 Pump
	L = X+1 Blender	**0** = 2 + 1 Grade Blender Dispenser **1** = 3 + 1 Grade Blender Dispenser **2** = 4 + 1 Grade Blender Dispenser **4** = 2 + 1 Grade Blender Pump **5** = 3 + 1 Grade Blender Pump **6** = 4 + 1 Grade Blender Pump
	N = X+0 Blender	**1** = 3 + 0 Grade Blender Dispenser **2** = 4 + 0 Grade Blender Dispenser **3** = 5 + 0 Grade Blender Dispenser **5** = 3 + 0 Grade Blender Pump **6** = 4 + 0 Grade Blender Pump **7** = 5 + 0 Grade Blender Pump
	P = Ultra High Flow	**3** = Ultra-Hi Master **4** = Ultra-Hi Combo **5** = Ultra-Hi Satellite **6** = Ultra-Hi Master Dispenser - Single Sided Dual Product Unit **8** = Ultra-Hi Satellite Dispenser - Single Sided Dual Product Unit
	R = Special	**0** = No Hydraulics **1** = Robot **2** = Simulator **3** = Pumpless Pump **4** = No Electronics

Encore 550 with SMART Meter™

Type	Model	Description	Product Inlets	Dispensed Grades	Hoses Per Side	Meters
MPD	NA0	MPD Dispenser, 1-grade	1	1	1	2
	NA1	MPD Dispense, 2-grade	2	2	2	4
	NA2	MPD Dispenser, 3-grade	3	3	3	6
	NA3	MPD Dispenser, 4-grade	4	4	4	8
Single-hose	NG4	Single-hose MPD Dispenser, 2-grade	2	2	1	4
	NG0	Single-hose MPD Dispenser, 3-grade	3	3	1	6
	NG1	Single-hose+1 MPD Dispenser, 4-grade	4	4	2	8
X+0 Blender	NN1	Blender Dispenser 3 + 0	2	3	1	4
	NN2	Blender Dispenser 4 + 0	2	4	1	4
	NN3	Blender Dispenser 5 + 0	2	5	1	4
X + 1 Blender	NL0	Blender Dispenser 2 +1	3	3	2	6
	NL1	Blender Dispenser 3 +1	3	4	2	6
	NL2	Blender Dispenser 4 +1	3	5	2	6
Multi-hose Blender	NJ0	Multi-hose Blender Dispenser	2	3	3	4
	NJ2	Multi-hose+1 Blender Dispenser	3	4	4	6

Abbreviations and Acronyms

Term	Description
ASC	Authorized Service Contractor
CIM™	Customer Interface Module
CRIND®	Card Reader IN Dispenser
MPD	Multi Product Dispenser
NFPA	National Fire Protection Agency
NPT	• National Pipe Taper • National Pipe Thread
PTFE	PolyTetraFluoroEthylene (The chemical name for Teflon®).
STP	Submerged Turbine Pump
TLS	Tank Level Sensor
UST	Underground Storage Tank

Common Terms

Term	Description
CIM Door	Customer Interface Module Door - Main pump and CRIND displays are mounted on this door
Combo	This unit is configured as Master on one side and Satellite on the other.
Dispenser	A dispensing device that receives fuel under pressure from the STP at the UST.
Ecometer	A twin screw hydraulic/electronic device that measures the flow delivered from the UST to the end user.
Grade	Fuel that is dispensed and has an assigned price
Listed	Products bearing authorized Listing Mark of Underwriters' Laboratories (UL®) as manufacturer's declaration that product complies with UL's requirements in accordance with terms of UL's Listing and Follow-Up Service agreement.
Master	This unit dispenses fuel to one saddle tank and to a second saddle tank via a satellite unit
Product	Refers to fuel in storage tank.
Pump	A dispensing device that utilizes a self-contained pumping unit and motor to move fuel from storage tank using suction.
PVC	Polyvinyl chloride
Satellite	A dispensing unit that receives product from and registers at the Master unit allowing both saddle tanks on a vehicle to be filled at same time.
SMART Meter	Electronic device that measures the flow of product from the UST to the end user.
Teflon	The DuPont™ trade name for PTFE.

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2 – Important Safety Information

This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock or pressure release could occur and cause death or serious injury, if these safe service procedures are not followed.

Preliminary Precautions
You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain or service this equipment.

Emergency Total Electrical Shut-Off
The first and most important information you must know is how to stop all fuel flow to the pump/dispenser and island. Locate the switch or circuit breakers that shut off all power to all fueling equipment, dispensing devices, and Submerged Turbine Pumps (STPs).

⚠ WARNING

The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station WILL NOT shut off electrical power to the pump/dispenser. This means that even if you activate these stops, fuel may continue to flow uncontrolled.

You must use the TOTAL ELECTRICAL SHUT-OFF in the case of an emergency and not the console's ALL STOP and PUMP STOP or similar keys.

Total Electrical Shut-Off Before Access
Any procedure that requires access to electrical components or the electronics of the dispenser requires total electrical shut off of that unit. Understand the function and location of this switch or circuit breaker before inspecting, installing, maintaining, or servicing Gilbarco equipment.

Evacuating, Barricading and Shutting Off
Any procedure that requires access to the pump/dispenser or STPs requires the following actions:

- An evacuation of all unauthorized persons and vehicles from the work area
- Use of safety tape, cones or barricades at the affected unit (s)
- A total electrical shut-off of the affected unit (s)

Read the Manual
Read, understand and follow this manual and any other labels or related materials supplied with this equipment. If you do not understand a procedure, call a Gilbarco Authorized Service Contractor or call the Gilbarco Support Center at 1-800-800-7498. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

Follow the Regulations
Applicable information is available in National Fire Protection Association (NFPA) 30A; *Code for Motor Fuel Dispensing Facilities and Repair Garages*, NFPA 70; *National Electrical Code (NEC)*, Occupational Safety and Hazard Association (OSHA) regulations and federal, state, and local codes. All these regulations must be followed. Failure to install, inspect, maintain or service this equipment in accordance with these codes, regulations and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

Replacement Parts
Use only genuine Gilbarco replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gilbarco replacement parts could create a safety hazard and violate local regulations.

Safety Symbols and Warning Words

This section provides important information about warning symbols and boxes.

Alert Symbol

This safety alert symbol is used in this manual and on warning labels to alert you to a precaution which must be followed to prevent potential personal safety hazards. Obey safety directives that follow this symbol to avoid possible injury or death.

Signal Words
These signal words used in this manual and on warning labels tell you the seriousness of particular safety hazards. The precautions below must be followed to prevent death, injury or damage to the equipment:

DANGER: Alerts you to a hazard or unsafe practice which will result in death or serious injury.

WARNING: Alerts you to a hazard or unsafe practice that could result in death or serious injury.

CAUTION with Alert symbol: Designates a hazard or unsafe practice which may result in minor injury.

CAUTION without Alert symbol: Designates a hazard or unsafe practice which may result in property or equipment damage

Working With Fuels and Electrical Energy

Prevent Explosions and Fires
Fuels and their vapors will explode or burn, if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause potentially dangerous vapors in the vicinity of the dispenser or island.

No Open Fire

Open flames from matches, lighters, welding torches or other sources can ignite fuels and their vapors.

No Sparks - No Smoking

Sparks from starting vehicles, starting or using power tools, burning cigarettes, cigars or pipes can also ignite fuels and their vapors. Static electricity, including an electrostatic charge on your body, can cause a spark sufficient to ignite fuel vapors. Every time you get out of a vehicle, touch the metal of your vehicle, to discharge any electrostatic charge before you approach the dispenser island.

Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Familiarize yourself with Cardiopulmonary Resuscitation (CPR) methods, if you work with or around high voltages. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA Lockout/ Tagout procedures. If you are not familiar with this requirement, refer to this information in the service manual and OSHA documentation.

Working With Electricity Safely

Ensure that you use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock. Ensure that grounding connections are properly made. Take care that sealing devices and compounds are in place. Ensure that you do not pinch wires when replacing covers. Follow OSHA Lockout/ Tagout requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down.

Hazardous Materials

Some materials present inside electronic enclosures may present a health hazard if not handled correctly. Ensure that you clean hands after handling equipment. Do not place any equipment in the mouth.

⚠ WARNING

The pump/dispenser contains a chemical known to the State of California to cause cancer.

⚠ WARNING

The pump/dispenser contains a chemical known to the State of California to cause birth defects or other reproductive harm.

In an Emergency

Inform Emergency Personnel

Compile the following information and inform emergency personnel:

- Location of accident (for example, address, front/back of building, and so on)
- Nature of accident (for example, possible heart attack, run over by car, burns, and so on)
- Age of victim (for example, baby, teenager, middle-age, elderly)
- Whether or not victim has received first aid (for example, stopped bleeding by pressure, and so on)
- Whether or not a victim has vomited (for example, if swallowed or inhaled something, and so on)

⚠ WARNING

Gasoline ingested may cause unconsciousness and burns to internal organs.
Do not induce vomiting.
Keep airway open.
Oxygen may be needed at scene.
Seek medical advice immediately.

⚠ WARNING

Gasoline inhaled may cause unconsciousness and burns to lips, mouth and lungs.
Keep airway open.
Seek medical advice immediately.

⚠ WARNING

Gasoline spilled in eyes may cause burns to eye tissue.
Irrigate eyes with water for approximately 15 minutes.
Seek medical advice immediately.

⚠ WARNING

Gasoline spilled on skin may cause burns.
Wash area thoroughly with clear water.
Seek medical advice immediately.

IMPORTANT: Oxygen may be needed at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

Lockout/Tagout

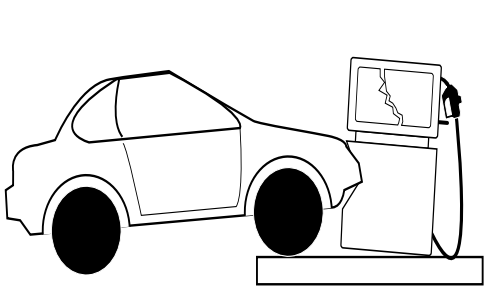
Lockout/Tagout covers servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machine(s) or equipment or release of stored energy could cause injury to employees or personnel. Lockout/Tagout applies to all mechanical, hydraulic, chemical or other energy, but does not cover electrical hazards. Subpart S of 29 CFR Part 1910 - Electrical Hazards, 29 CFR Part 1910.333 contains specific Lockout/ Tagout provision for electrical hazards.

Hazards and Actions

WARNING

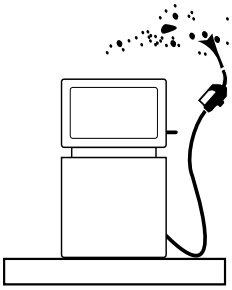
Spilled fuels, accidents involving pumps/dispensers, or uncontrolled fuel flow create a serious hazard.
Fire or explosion may result, causing serious injury or death.
Follow established emergency procedures.

The following actions are recommended regarding these hazards:



Collision of a Vehicle with Unit

Fire at Island



Fuel Spill

- Do not go near a fuel spill or allow anyone else in the area.
- Use station EMERGENCY CUTOFF immediately. Turn off all system circuit breakers to the island(s).
- Do not use console E-STOP, ALL STOP and PUMP STOP to shut off power. These keys do not remove AC power and do not always stop product flow.
- Take precautions to avoid igniting fuel. Do not allow starting of vehicles in the area. Do not allow open flames, smoking or power tools in the area.
- Do not expose yourself to hazardous conditions such as fire, spilled fuel or exposed wiring.
- Call emergency numbers.

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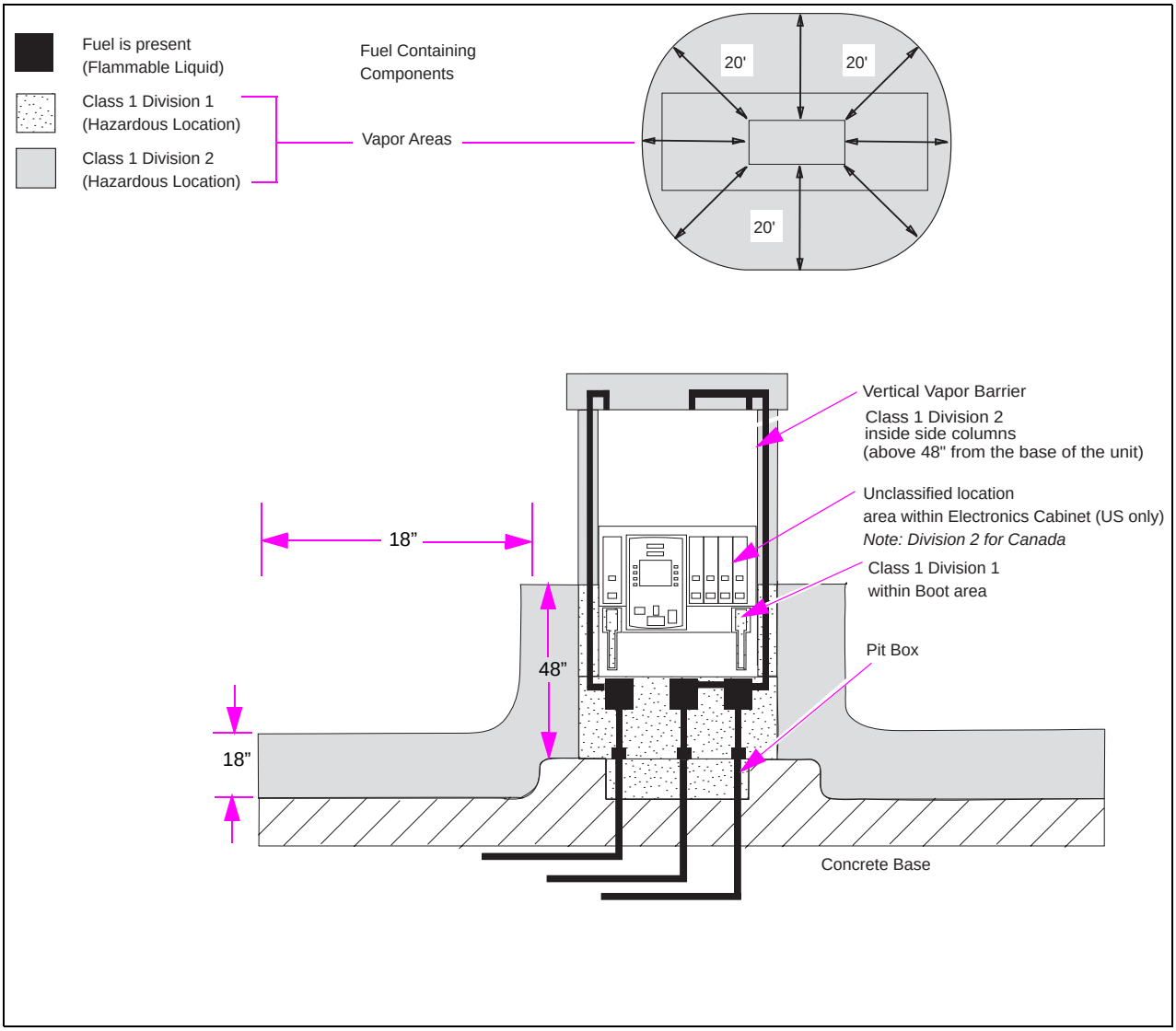
3 – Hazardous Locations

Classifying Hazardous Locations

Any activity that can cause an explosion (such as smoking or drilling) must be done well outside the vapor area.

Figure 3-1 is based on NFPA 30A and NFPA 70.

Figure 3-1: Hazardous Locations Diagram



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4 – Preliminary Installation Information

Replacing the Advantage Series Units with Encore Units

If you are replacing the Advantage Series® unit(s) with Encore units, read "Installation Differences when Replacing the Advantage Series" on page 92 before you begin.

Required Equipment and Materials

The following items are required to properly install the equipment:

- Anchor bolts
- U-bolts for fastening piping to braces.
- Sealant that is UL-approved for use with fuels being encountered
- Pit Box cover plates. Use when necessary to adapt the unit to preexisting pit boxes.
- Lifting device (crane, backhoe, forklift, and so on) to move and lift the pump/dispenser.
- Nylon slings (with a safety lift factor of 5) and screw-pin anchor shackles to lift high hose pump/dispenser (refer to "Encore Shipping Weight and Model Codes: N-X-X" on page 2).
- Breakaways, hoses, nozzles, and swivels
- Barricades
- Potting compound and fiber dam material to allow potting of conduit in accordance with Class I, Division II locations as specified in the National Electric Code.
- Any kits required for upgrading the unit to the customer's requirements such as hose retrievers and so on.

Read NFPA 30A and NFPA 70

⚠ WARNING

You are working in a dangerous environment of gasoline, gasoline vapor and electricity.
Failure to install this equipment in accordance with NFPA 30A and NFPA 70 could result in severe injury or death.
Read, understand and follow NFPA 30A and NFPA 70.

Before installing the equipment, read, understand and follow:

- The National Electric Code (NFPA 70)
- The Automotive and Marine Service Code (NFPA 30A)
- Any national, state, and local codes that may apply

Failure to install the equipment in accordance with NFPA 30A and NFPA 70 may adversely affect the safe use and operation of the system.

Accurate, sound installations reduce service calls. Experienced, licensed contractors must perform the installation and follow accurate and safe installation techniques. Careful installation can eliminate potential problems.

The equipment manufacturer must provide instructions for other equipment such as Submerged Turbine Pumps (STP), shear valves and underground tanks. Gilbarco does not provide complete installation instructions for other manufacturer's equipment.

Important Considerations When Changing Fuel Types

⚠ WARNING

Certain special alternative fuels and additives can degrade pump/dispenser performance or integrity if the dispensers are not designed for use with such fuels. Additionally, converting to certain standard fuels (gasoline, diesel, kerosene, and so on) from alternative fuels such as those with ethanol, methanol or Biodiesel or from alternative fuels to standard fuels can degrade dispenser performance or integrity. Similar effects can also occur when converting units to different standard fuel types.

Leaks and potential environmental hazards can result or components may fail prematurely.

To avoid these issues, follow the guidelines as outlined in this section.

Follow the guidelines given below when changing fuel types for a pump/dispenser or using alternative fuels.

1. Verify with your Gilbarco ASC or Distributor that the fuel which you will be using is compatible with the pumps/dispensers to be dispensing the fuel.

2. For Flexible fuel dispensers, do not use standard hydraulic parts used in other Gilbarco pumps/dispensers in these units. Standard dispenser parts may not be compatible with the fluids.

3. Biodiesel fuels must be to ASTM standards for Biodiesel fuels. Mixes of diesel with cooking oils, other plant or animal derived oils, and so on are not considered Biodiesel. Use of such mixes may void warranty on the hydraulic components of the unit.

4. Review the latest copy of the unit's warranty statement regarding use of the fuel.

5. Certain fuels (especially fuels enhanced with alcohol) when first used in tanks previously containing a different fuel may clean out the tanks and force a large amount of contaminant into the dispenser. Aside from abnormally clogging filters, this large quantity of contaminant may damage certain dispenser components. Do not run units without filters at such times. It is normally required that tanks and lines be cleaned of all water, sediment and contaminant prior to such conversions to minimize potential unit downtime or damage. Damage to hydraulic components from contamination when not using filters is not covered by Warranty. Consult your ASC or Gilbarco Distributor for recommendations.

6 Although conversions from one fuel to an equivalent fuel (say from another supplier) generally do not create issues, it is recommended that after making any fuel type conversions (including those to alternative fuels or back), all units be visually inspected for leaks two days, one week and one month after fuel conversion. Have your ASC repair any leaks found. This should be done also for standard fuels when significant new additives are incorporated.

IMPORTANT INFORMATION
The above guideline does not apply to Flexible fuel model dispensers.

7 Whenever non-equivalent fuel conversions are performed, it is recommended that all units be checked for calibration within one month after the fuel conversion.

8 Some non-equivalent fuel conversions will necessitate the need to change the pump/dispenser filter type previously used. Consult your ASC or Gilbarco Distributor for any changes required.

9 In Flexible fuel dispensers, Gilbarco recommends the use of 10 micron filters for gasoline-based flexible fuels. Although the use of finer filtration is allowable, filters will tend to clog prematurely, causing excessive filter maintenance cost.

Installation Considerations for Units with Ecometers

The following considerations are in addition to those recommended for standard dispensers without Ecometers.

- Ecometers with proper air purging will not generally vary from initial calibration settings. Therefore, ensure that you accurately set the initial settings. It is not necessary to allow a break in period before finalizing calibration.
- Although initially set at the factory, meter calibration must still be verified/performed.

For Encore units with Ecometers, the following recommendations are absolute requirements. Failure to follow these requirements will be considered as abuse and could result in premature meter failure. Such damage will not be covered by warranty.

- You must always use the M008007B010 (gasoline) or M08007B030 (diesel) filter manufactured by PetroClear filter in the units.
- At no time during installation must the unit be run without a filter, with only a strainer, or with a different filter type.

  Note: There are no exceptions to this rule.
- You must never over-speed the meter by attempting to purge air through it at a high flow rate. You must follow the instructions for all meters as found in this manual.
- To ensure warranty coverage, dirty/contaminated fuel tanks must be cleaned prior to installation of Ecometer dispensers. If stations experience multiple failures of meters from contaminated fuel, warranty of the meters will be voided.

  Note: If filters have been plugging or failing prematurely, then the most likely cause is dirty fuel.

Software Considerations for Units with Ecometers

Units with Ecometers currently require V1.8.20 software or later. Versions earlier than V1.8.09 will not work with Ecometers.

Installation Checklists

Checklists for installation, startup and commissioning are provided in the documentation package supplied with each unit. The installer must complete the checklist for each unit installed, and insert it inside the unit's Electronics Cabinet. Ensure that the checklists are placed in an area away from electrical devices and wiring.

The Installation Checklist requires certain critical inspections by the installer to verify if the installation was done properly. Properly completed forms verify safe installation for certain critical areas and is necessary to obtain warranty coverage, to help ensure proper operation of the equipment, and provide some liability protection for the installer, manufacturer and customers. Instructions are included on the forms. Not all requirements found in this manual are included on the MDE-4226 Encore/Eclipse Installation Checklist, making it important for the installer to read, understand and follow all recommendations within this manual as well to ensure safe and proper operation.

Preparing for the Installation

To prepare for the installation, proceed as follows:

1. Read all instructions before you begin. It may be helpful to have a copy of MDE-4226 Encore/ Eclipse Installation Checklist on hand during the installation.

2. Follow all safety precautions:

   - Barricade the area.
   - Do not allow vehicles in the work area.
   - Do not smoke or allow open flames in the work area.
   - Do not use power tools in the work area.
   - Do not allow unauthorized people into the work area.
   - Wear eye protection during the installation.
   - Ensure that there is no power supplied to the units until required, as per later installation steps.

3. Use circuit breakers to turn off all power to pumps/dispensers and STPs. Multiple disconnects may be required.

4 Check the following for proper installation, as recommended in MDE-3802 Encore and Eclipse Site Preparation Manual and by other manufacturers.

- Emergency power cut off switch
- Circuit breakers
- STP control relay boxes - dispensers only (see note 3)
- Isolation relays - dispensers only (see note 3)
- Conduit and wiring (see note 1)
- Grounding
- Shear valves - dispensers only (see notes 2 and 4)
- Piping and fittings
- Fuel storage tanks
- Pressure regulating valves (aboveground tanks only)
- STP - dispensers only
- Tank and/or line leak detectors
- Pit boxes

Notes: 1) If you are replacing an existing unit, the installer may connect and extend existing field wires to the Electronics Cabinet using an explosion proof Junction Box (J-Box). Refer to "Before Mounting the Unit on the Fuel Island" on page 18 for details.

2) A shear valve (as per NFPA30A) is a safety device required for every product line at each dispenser. Refer to MDE-3802 Encore and Eclipse Site Preparation Manual for installation instructions. Shear valves may also be required for aboveground tank installations and other installations with pumps. Follow local and state requirements.

3) Refer to MDE-2755 STP Control and Dispenser Isolation Relay Box (PA0287).

4) Some locations require shear valves for vapor lines. Follow local and state regulations.

5 Inspect the pump/dispenser cartons and contents for shipping damage. Gilbarco does not cover shipping damage under its warranty policy. Notify the shipper of any damage.

6 Open the Customer Interface Module (CIM) door and remove any tie-wraps that are holding pulsers in place.

CAUTION

Not removing the shipping tie-wraps may result in inaccurate calibration or failure of the pulsers.

Note: Only some models are shipped with tie-wraps to secure the pulsers.

7 Remove the lower panels (doors) of the pump/dispenser. Refer to MDE-3804 Encore and Eclipse Start-up/Service Manual for the procedure to remove the lower panels.

8 Ensure that the fuel grade for the product lines matches the pump/dispenser brand panels and the foundation layout. Product lines from the island pit box should have labels.

Gaining Access to and from the Encore Cabinet

Encore cabinets are designed to protect the equipment inside from the elements. The doors and covers must be installed as directed. For more information, refer to the Owner/Service Manuals provided by the ASCs during commissioning.

On Encore 300/500 units containing special weather protection features, the top door must be opened first and then the bottom panel removed. While closing, the bottom panel must be reinstalled and then the top door closed. This will ensure weather proofing and protect the unit. For units that require further protective features, refer to MDE-4473 Encore Water Intrusion Prevention Kit.

Encore S Series units have features that prevent water intrusion into the dispenser's interior. However, the doors and covers must be opened or replaced in a specific order - the bottom panel first, which provides access, allowing the release of the security latch on the top door and opening of the door.

Before Mounting the Unit on the Fuel Island

⚠ WARNING

Flexible fuels such as Biodiesel, high alcohol percentage fuels, and so on may be incompatible with certain plumbing materials and hydraulic components.

Use of incompatible materials or components with alternative fuels can result in leaks or unexpected failures of components resulting in fire or explosion or environmental damage.

When dispensing alternative fuels, verify with the manufacturer of the material or component that all plumbing components are compatible with the fuel being dispensed.

Note: Before mounting the unit on the fuel island, read and understand this section completely. This information is essential to avoid installation errors.

Verifying and Determining Plumbing Requirements

Before placing a unit on an island, determine the correct location of piping for the unit involved and the proper orientation of the unit. A common installation error is to install the units backwards, which will require expensive modifications. This section contains information regarding plumbing requirements for various models of Encore Series dispensers.

IMPORTANT INFORMATION

Do not make assumptions about configurations based on previous experience, hose positions, or layout of the unit you are replacing, whether it is a Gilbarco unit or that of any other manufacturer.

Model grade mapping (inlet piping) for Encore units is different from the Advantage Series and Multi Product Dispenser (MPD)-3 Series as well as other manufacturers' units. Incorrect matching of unit piping to supply lines can cause costly rework and time delays.

Encore Y and Z inlets are never used for blended products. Z is always a Straight/Unblended Product Inlet; +Z is always a Straight/Unblended +1 Product.

Typical MPD configuration: W = Product 1, X = Product 2 and Y = Product 3. Product number does not signify the grade on MPD units, for example; Product 1 is not always Lo Grade, but is optionally Lo, Mid or Hi.

W = Product 1 (on Blenders only, Product 1 is always a Lo Product.)

Grade piping is always right to left when facing Side 1.

Adapting the Pit Box

For installation using an existing pit box, some modifications may be necessary. The following list highlights the changes that may be necessary. Refer to "Installation Differences when Replacing the Advantage Series" on page 92 for more information. These installation considerations may also apply when you are replacing competitive units.

To adapt the plumbing/conduit to Encore stub up locations:

- Use care in sizing and routing flexible piping to avoid bends that restrict flow. This is especially critical for pumps which may have serious issues with flow or noise if the flexible pipe cross section becomes significantly restrictive.
- Use flexible piping in the pit box for plumbing adaptation. If piping in the previous box is rigid, use the adaptability of the Encore hydraulic cabinet inlets and conduit entry points instead of making modifications to rigid plumbing and conduit in the pit box.
- When adapting plumbing in the dispenser cabinet, remember that the lower piping cross brace must be used to secure plumbing above the shear valve and that rigid piping must be used within the dispenser.
- Modify the pit box rain lip when required (for boxes designed for the Advantage Series wide frame units). Modifications will also typically be done to the Encore base.
- When adapting an Encore to an existing pit box or one that is not specifically designed for the unit, the rain lip may require modification or removal. If the rain lip is removed, the entire base of the dispenser must be sealed to the island. Study the foundation layouts and the existing pit box to determine if modifications are required before mounting the unit on the island. Refer to the following Warning for working in this area.

⚠ WARNING

You are working in a potentiality hazardous environment where fuels and their vapors may be present and could be ignited with sparks from grinding and cutting tools.

Always conduct work at the required safe distance away from a hazardous area and use the appropriate tools.

Conduit Installation at the Pump/Dispenser

Options exist for installing conduit up to the units:

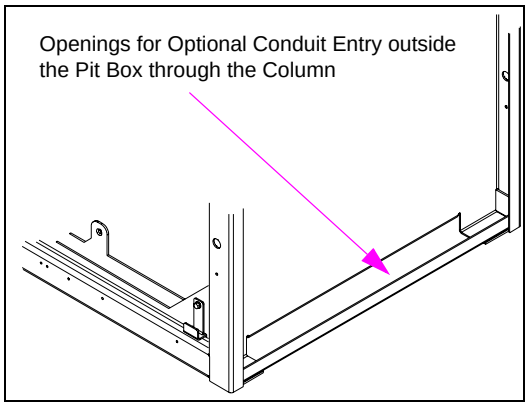
- Use existing conduit commonly through the pit box.
- Conduit not penetrating the pit box but entering the pump dispenser through the side column(s) of the unit.

The first method is commonly found with existing applications. The second is preferably recommended for new ground and up installations.

Installing Units with Conduit Entry in the Side of the Electronics Cabinet

Installation cost can commonly be reduced for new sites by installing conduit to the dispenser through the side columns and then into the side(s) of the Electronics Cabinet. Side column conduit routing eliminates the need for conduit to penetrate the pit box and costs and issues potentially related to that. Entry of conduit into the side of the Electronics Cabinet simplifies the routing and forming of conduit. Certain requirements exist to ensure that such installation is per Gilbarco recommendations and will meet code.

Figure 4-1: Modified Encore Base for Rain Lip Clearance and Side Column Conduit Entrance

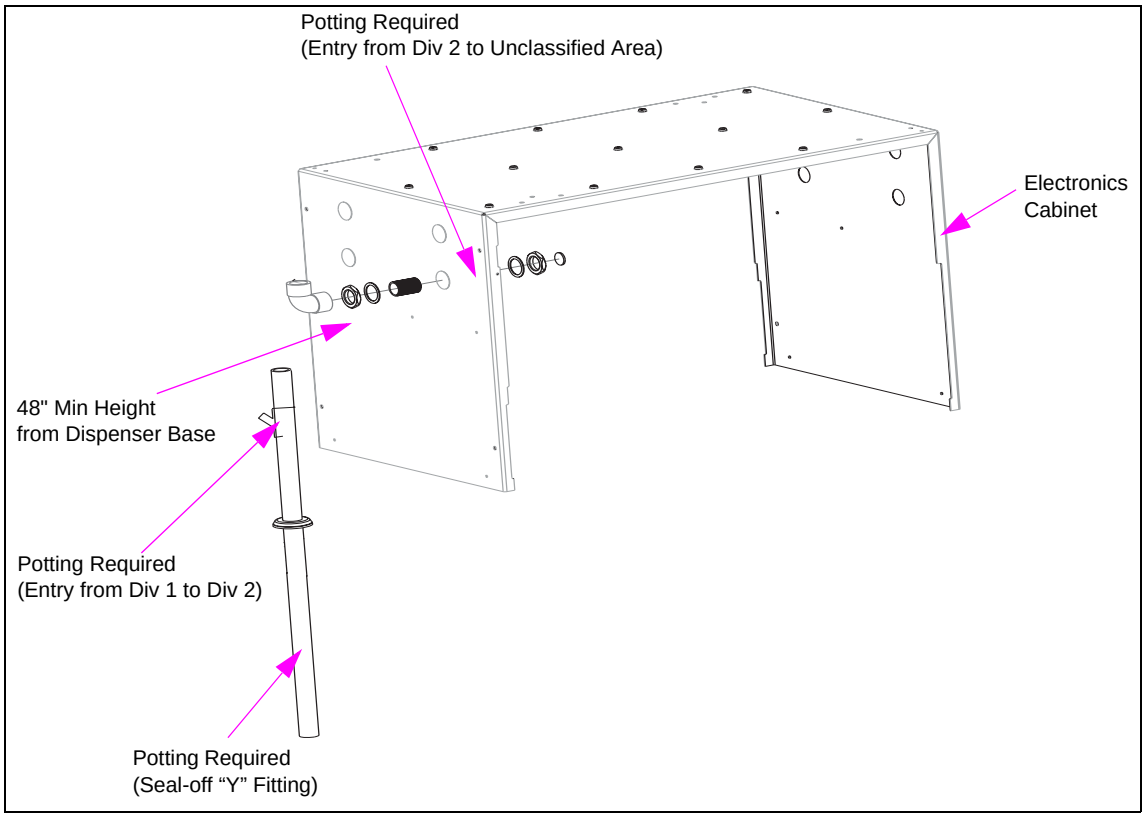


For new installations, install the dispenser conduit such that it does not penetrate the pit box. The dispensers have bases that allow the conduit to enter the dispenser through the columns outside of the pit box. See Figure 4-1.

The following guidelines must be followed when installing the unit.

- Special care must be taken when lowering the dispenser over the conduit to avoid damage to the conduit or any pulled wiring. Temporary removal of the side panel is recommended to aid in visualizing, and for later installation of an additional conduit segment. Preferably, the wiring should be pulled after the dispenser is placed over the conduit.
- Two options are possible for routing the wiring to the Electronics Cabinet:
  - From the column to the Hydraulics Cabinet, and then through the lower and upper air gap plates.
  - Through the column to the side of the Electronics Cabinet and then into the Electronics Cabinet using one or more of the knock out holes provided.

Figure 4-2: Conduit Potting (through side of the Electronics Cabinet)



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5 – Unit Configuration

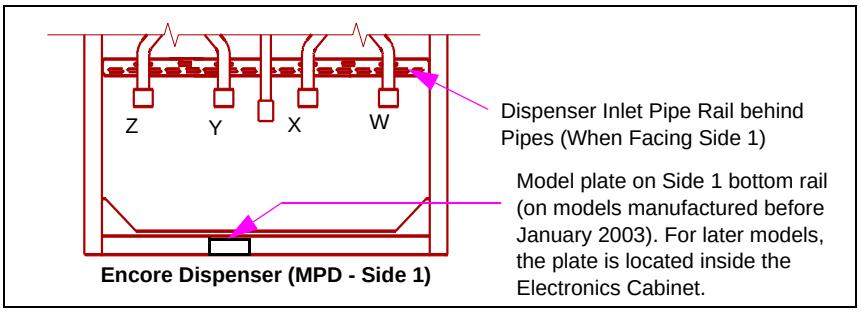
Multi Product (MPD) Configuration

Dispenser (MPD) Configuration

For Dispenser Blenders, proceed to "Dispenser Blender Configuration" on page 30. For additional information, refer to M01432 Foundation Layout-Encore.

Note: For units with the Ecometer option, pipe directly to manifold. Practice care installing piping directly to the aluminum manifold. It is strongly recommended that you attach the lower U-bolts to the installer-provided inlet pipe, at the cross bar, before wrenching the pipe tight. This will help prevent damage to the manifold threads or casting from incorrect threading or side loading of the pipe from wrench action during tightening. The U-bolts should be initially tightened to still allow the pipe to be easily tightened but remain aligned. Once the pipe is installed, then tighten all the U-bolts.

Figure 5-1: Encore Dispenser MPD Product Inlets


Z
Y
X
W
Dispenser Inlet Pipe Rail behind Pipes (When Facing Side 1)
Model plate on Side 1 bottom rail (on models manufactured before January 2003). For later models, the plate is located inside the Electronics Cabinet.
Encore Dispenser (MPD - Side 1)

Model #	Multi Product Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NA0	1 Grade 2 Hose MPD Dispenser	W	W = Product 1
NA1	2 Grade 4 Hose MPD Dispenser	W, X	W = Product 1 X = Product 2
NG4	2 Grade Single Hose MPD Dispenser		
NA2	3 Grade 6 Hose MPD Dispenser	W, X, Y	W = Product 1 X = Product 2 Y = Product 3
NG0	Single Hose MPD Dispenser 3 Grade 2 Hoses		
NA3	MPD Dispenser 4 Grade 8 Hose	W, X, Y, Z	W = Product 1 X = Product 2 Y = Product 3 Z = Product 4

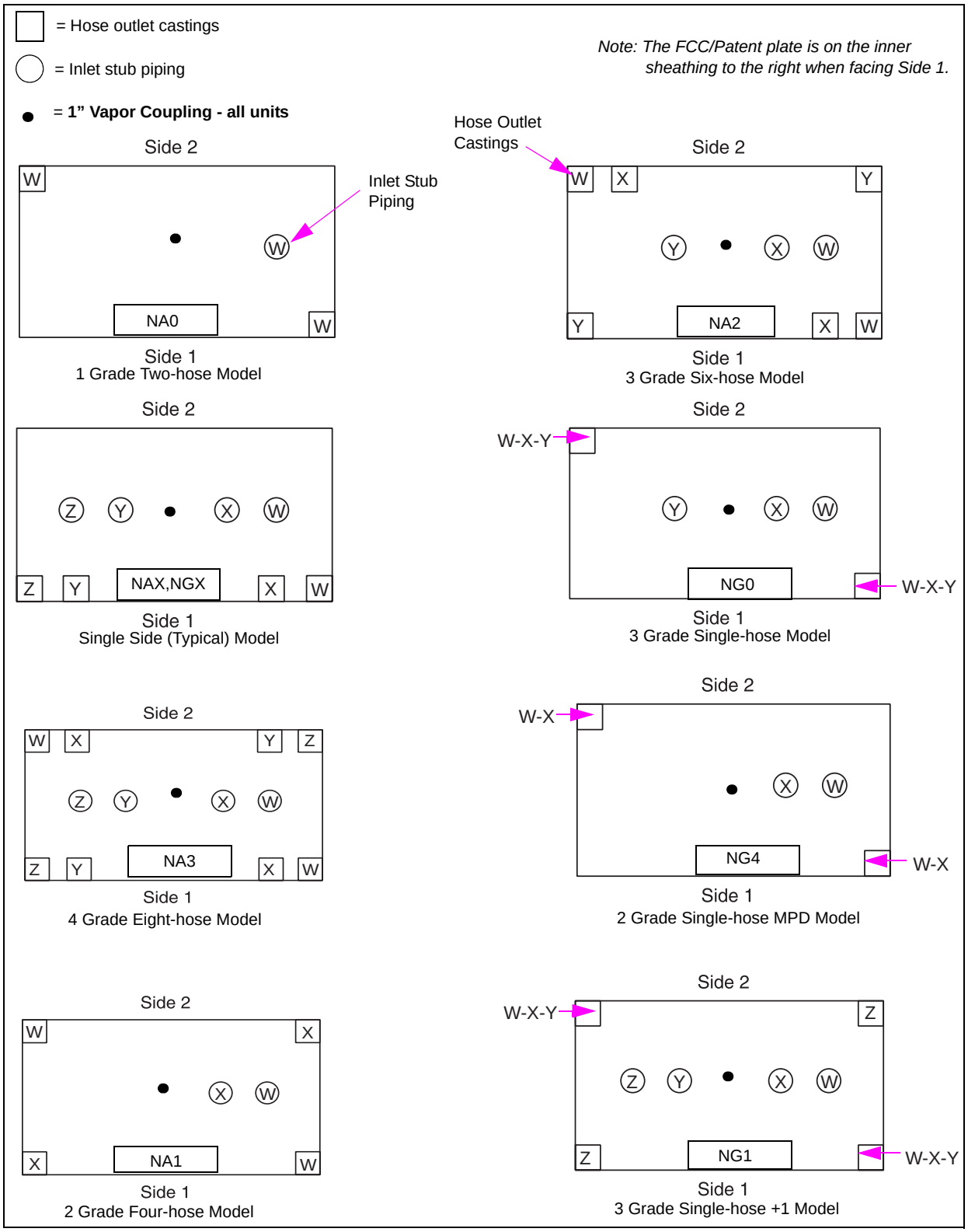
Model #	Multi Product Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NG1	Single-hose +1 MPD Dispenser, 3+1 Grade, 4 Hoses	W, X, Y, +Z	W = Product 1 X = Product 2 Y = Product 3 +Z = Straight/ Unblended Product

Notes:
The information provided in the table is for two-sided units.
- Z is always a Straight/Unblended Product Inlet; +Z is always a Straight/Unblended +1 Product.
- Product number does not signify grade on MPD units; for example, Product 1 is not always Lo Grade, but is optionally Lo, Mid or Hi.

Dispenser MPD Piping to Hose Fitting Configurations

Note: For multi-hose units, piping must align with graphics when facing Side 1.

Figure 5-2: Encore Dispenser MPD Piping to Hose Fitting Layout

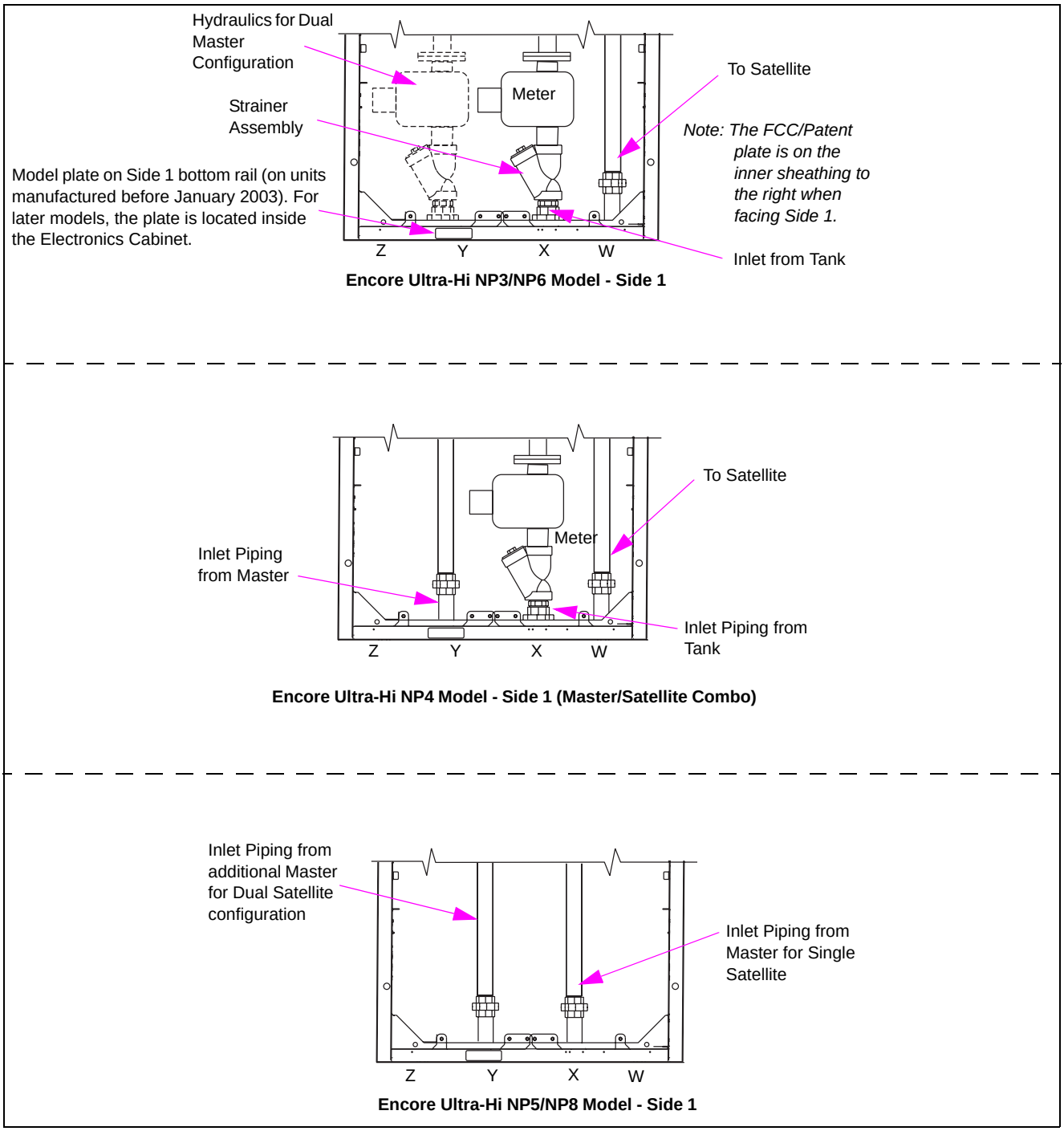


Ultra-Hi Configuration

Dispenser, Ultra-Hi Configuration

For MPD configuration, refer to "Dispenser (MPD) Configuration" on page 23; for Dispenser Blender, proceed to "Dispenser Blender Configuration" on page 30.

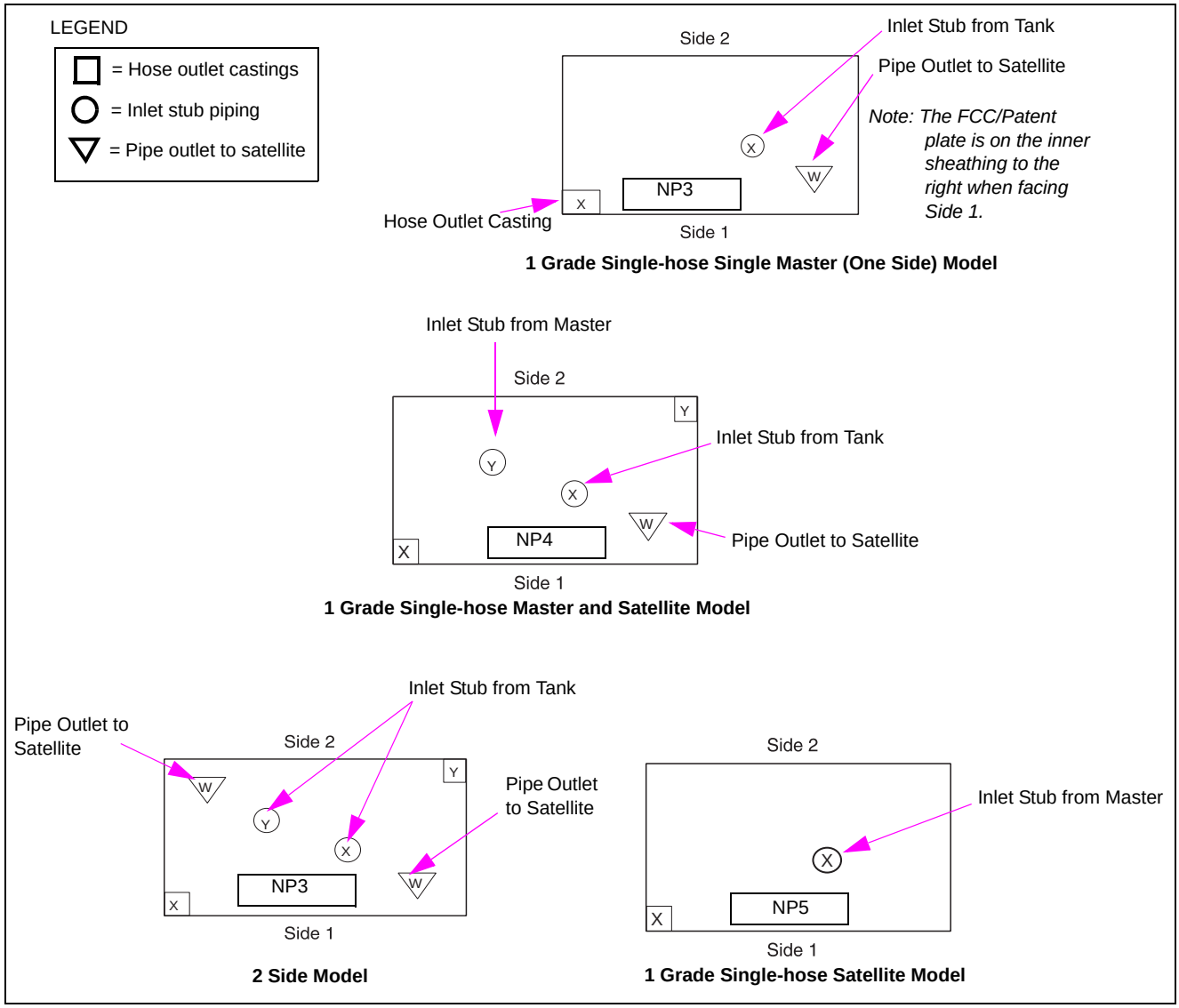
Figure 5-3: Dispenser (Ultra-Hi) Product Inlets


Hydraulics for Dual Master Configuration
Strainer Assembly
Model plate on Side 1 bottom rail (on units manufactured before January 2003). For later models, the plate is located inside the Electronics Cabinet.
Meter
To Satellite
Note: The FCC/Patent plate is on the inner sheathing to the right when facing Side 1.
Inlet from Tank
Z
Y
X
W
Encore Ultra-Hi NP3/NP6 Model - Side 1
Inlet Piping from Master
Meter
To Satellite
Inlet Piping from Tank
Z
Y
X
W
Encore Ultra-Hi NP4 Model - Side 1 (Master/Satellite Combo)
Inlet Piping from additional Master for Dual Satellite configuration
Inlet Piping from Master for Single Satellite
Z
Y
X
W
Encore Ultra-Hi NP5/NP8 Model - Side 1

Model #	Ultra-Hi Dispenser Model Description	Encore Inlets
NP3/NP6	Ultra-Hi Master Dispenser 1-side	X from tank
NP3/NP6	Ultra-Hi Master Dispenser 2-side	X from tank Y from tank
NP4	Ultra-Hi Combo Dispenser 1-grade	X from tank Y from master
NP5/NP8	Ultra-Hi Satellite Dispenser 1-side	X from master
NP5/NP8	Ultra-Hi Satellite Dispenser 2-side	X from master Y from master

Dispenser Ultra-Hi Piping to Hose Fitting Configuration

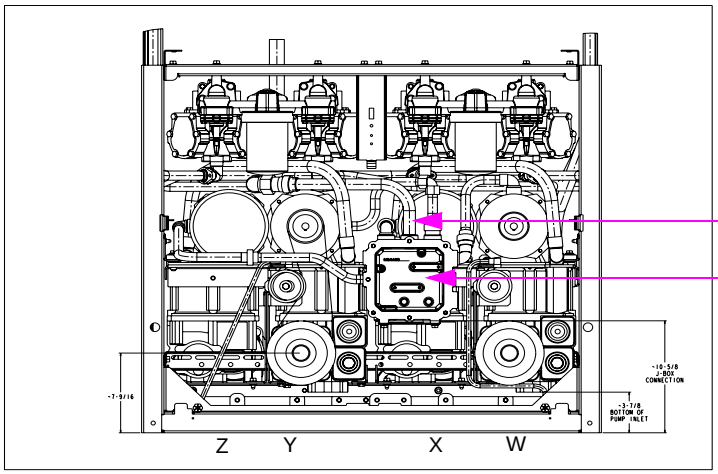
Figure 5-4: Encore Dispenser Ultra-Hi Piping to Hose Fitting Layout



Pumps (MPD) Configuration

For pump Blender configuration, refer to "Pump Blender Configuration" on page 33.

Figure 5-5: Encore Pump (MPD) Product Inlets and J-Box



Note: The FCC/Patent plate is on the inner sheathing to the right when facing Side 1.

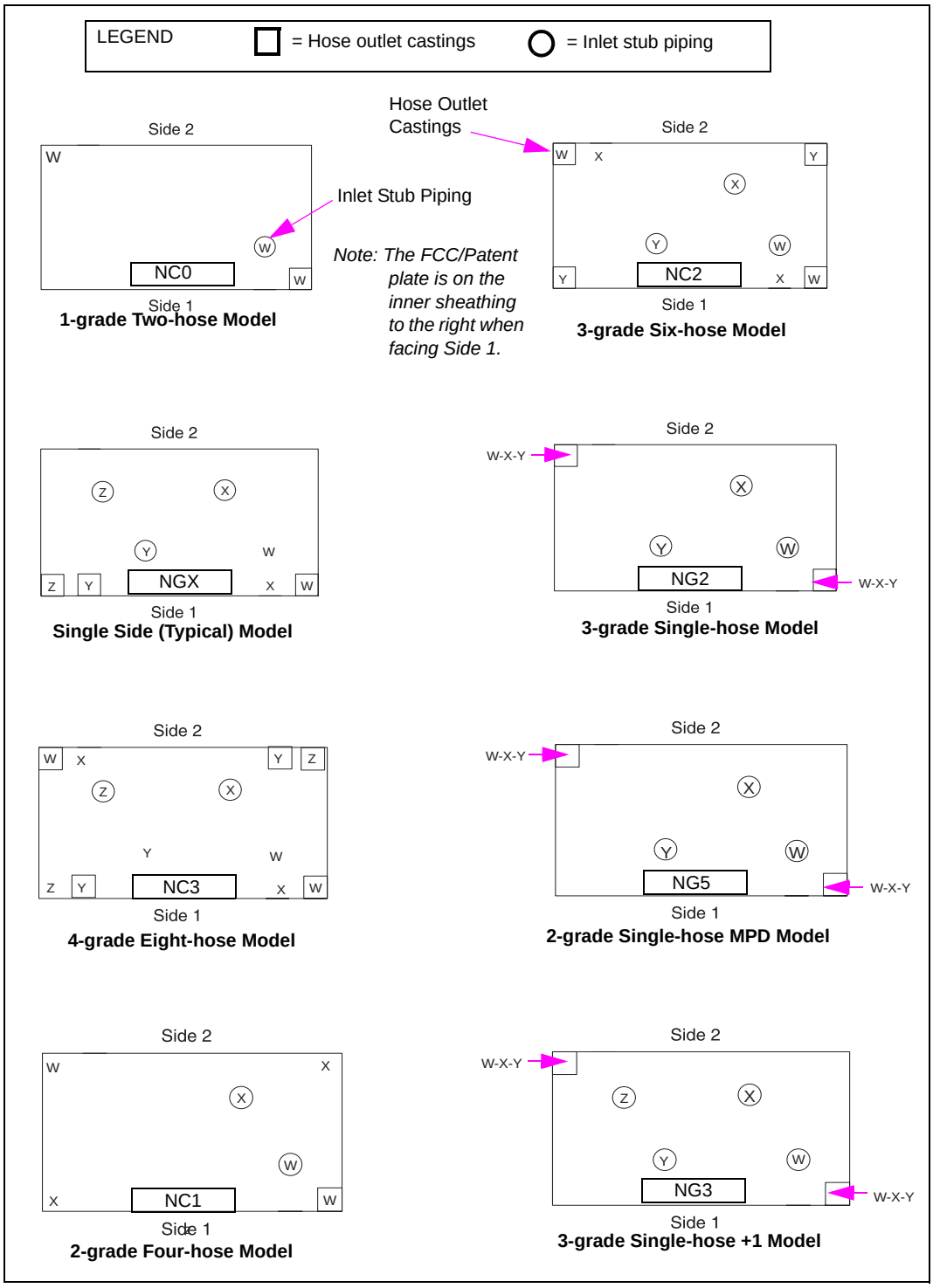
Model #	Multi Product Pump Model Description	Encore Inlets	Product Inlets (Typical)
NC0	1-grade 2-hose MPD Pump	W	W = Product 1
NC1	2-grade 4-hose MPD Pump	W, X	W = Product 1 X = Product 2
NG5	2-grade Single Hose MPD Pump		
NC2	3-grade 6-hose MPD Pump	W, X, Y	W = Product 1 X = Product 2 Y = Product 3
NG2	Single Hose MPD Pump 3-grade 2 Hoses		
NC3	MPD Pump 4-grade 8 Hose	W, X, Y, Z	W = Product 1 X = Product 2 Y = Product 3 Z = Product 4
NG3	Single-hose +1 MPD Pump, 3+1 Grade, 4 Hoses	W, X, Y, +Z	W = Product 1 X = Product 2 Y = Product 3 +Z = Straight/ Unblended Product

Notes:
The information provided in the table is for two-sided units.
- Z is always a Straight/Unblended Product Inlet; +Z is always a Straight/Unblended +1 Product.
- Product number does not signify grade on MPD units; for example, Product 1 is not always Lo Grade, but is optionally Lo, Mid or Hi.

Pump (MPD) Piping to Hose Fitting Configuration

Note: For multi-hose units, piping must align with graphics when facing Side 1.

Figure 5-6: Encore Pump Piping to Hose Fitting Layout



Blender Configuration

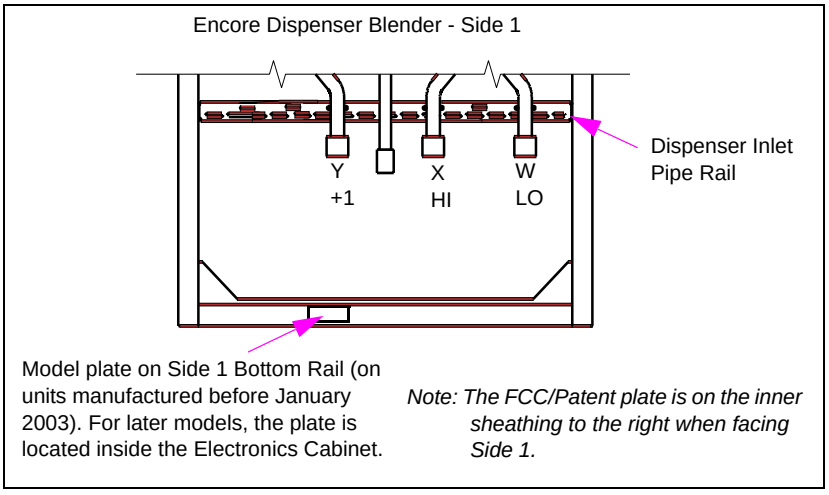
Dispenser Blender Configuration

For dispenser (MPD) blender configuration, refer to "Dispenser (MPD) Configuration" on page 23.

Read and understand all information in "Before Mounting the Unit on the Fuel Island" on page 18.

Note: For units with the Ecometer option, pipe directly to manifold. Practice care installing piping directly to the aluminum manifold. It is strongly recommended that you attach the lower U-bolts to the installer-provided inlet pipe, at the cross bar, before wrenching the pipe tight. This will help prevent damage to the manifold threads or casting from incorrect threading or side loading of the pipe from wrench action during tightening. The U-bolts should be initially tightened to still allow the pipe to be easily tightened but remain aligned. Once the pipe is installed, then tighten all the U-bolts.

Figure 5-7: Dispenser (MPD) Product Inlets


Encore Dispenser Blender - Side 1
Y
+1
X
HI
W
LO
Dispenser Inlet Pipe Rail
Model plate on Side 1 Bottom Rail (on units manufactured before January 2003). For later models, the plate is located inside the Electronics Cabinet.
Note: The FCC/Patent plate is on the inner sheathing to the right when facing Side 1.

Model #	Blender Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NN1	Blender Dispenser 3+0	W, X	W = Lo Product X = Hi Product
NN2	Blender Dispenser 4+0		
NN3	Blender Dispenser 5+0		
NJ0	Multi-hose Blender Dispenser 3-grade 6-hose		

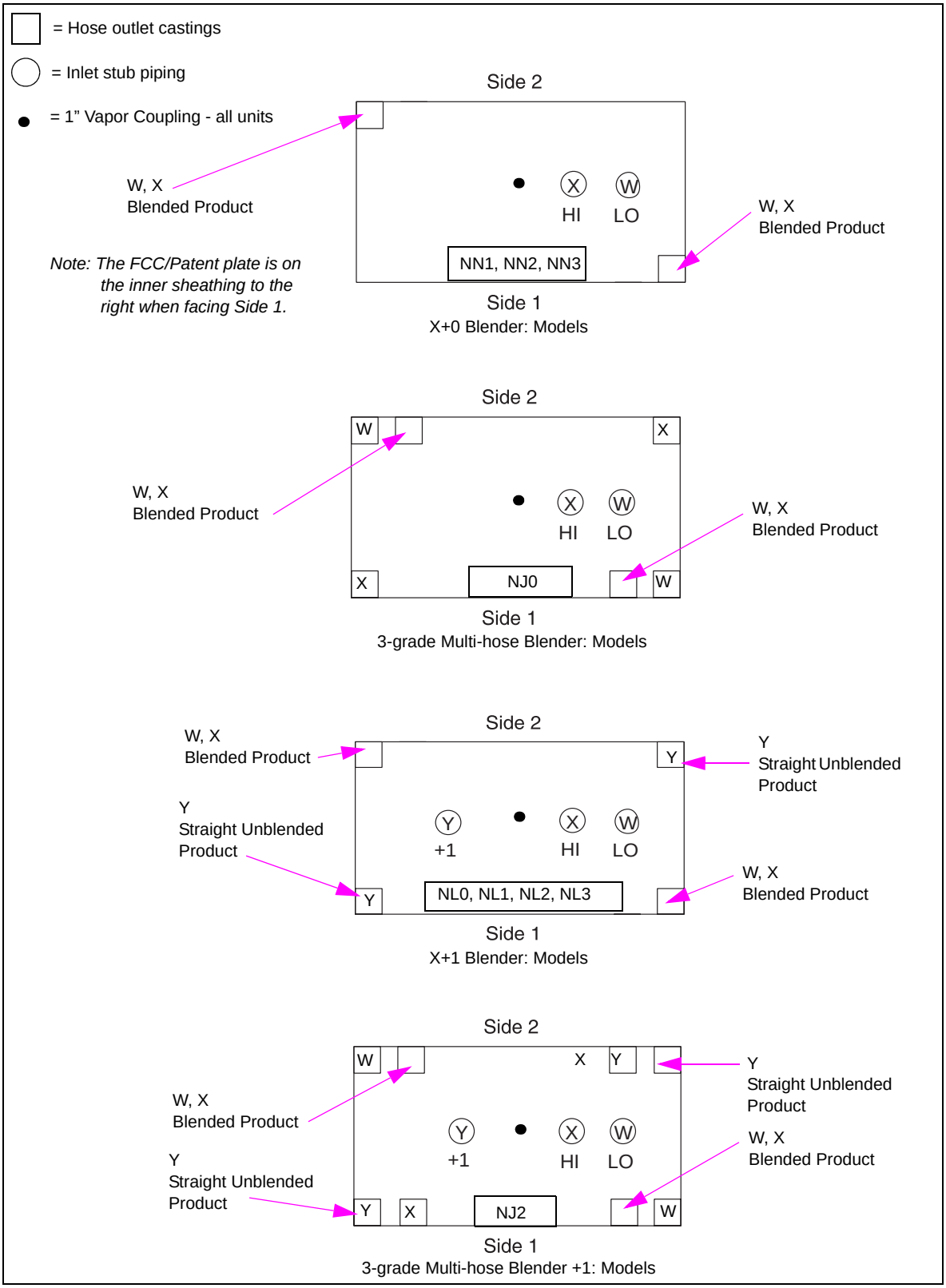
Model #	Blender Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NL0	Blender Dispenser 2+1	W, X, Y	W = Lo Product X = Hi Product Y = +1 Straight/ Unblended Product
NL1	Blender Dispenser 3+1		
NL2	Blender Dispenser 4+1		
NL3	Blender Dispenser 5+1		
NJ2	Multi-hose Blender Dispenser 3+1 Grade, 8-hose		

Notes:

- *W = Product 1 (**On Blenders only** Product 1 is **always** Lo Product)*
- *X = Product 2*
- *Y = Straight/Unblended Product Inlet*

Dispenser Blender Piping to Hose Fitting Configuration

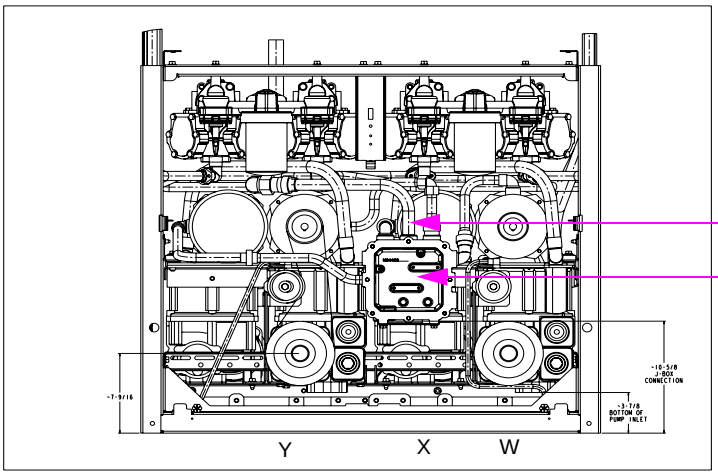
Figure 5-8: Encore Dispenser Blender Piping to Hose Fitting Layout



Pump Blender Configuration

For Pump (MPD) configuration, refer to "Pumps (MPD) Configuration" on page 28.

Figure 5-9: Encore Pump Blender Product Inlets



Note: The FCC/Patent plate is on the inner sheathing to the right when facing Side 1.

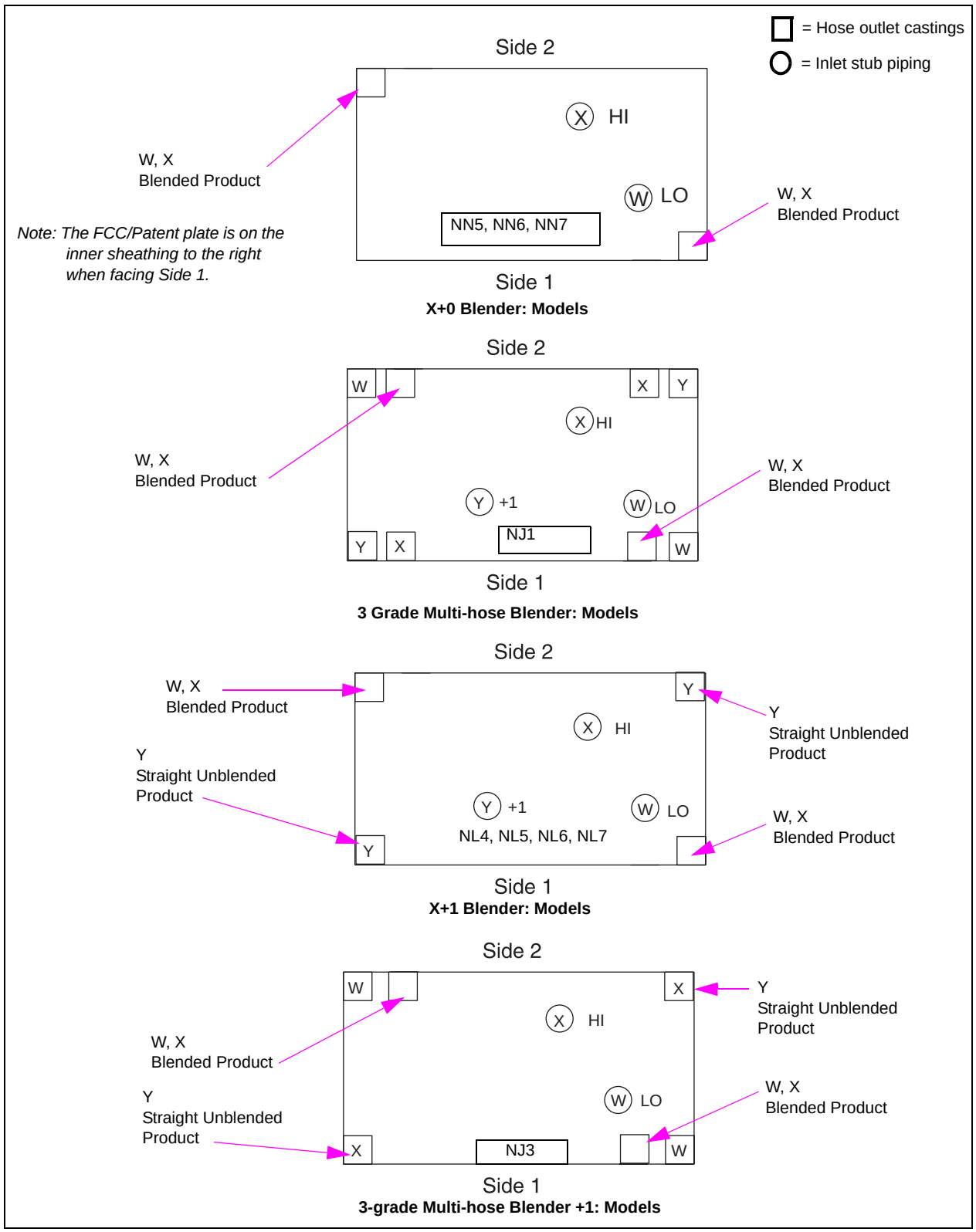
Model #	Pump Blender Model Description	Encore Inlets	Product Inlets (Typical)
NN5	Blender Pump 3+0	W, X	W = Lo Product X = Hi Product
NN6	Blender Pump 4+0		
NN7	Blender Pump 5+0		
NJ1	Multi-hose Blender Pump 3-grade 6-hose		
NL4	Blender Pump 2+1	W, X, Y	W = Lo Product X = Hi Product Y = +1 Straight/ Unblended Product
NL5	Blender Pump 3+1		
NL6	Blender Pump 4+1		
NL7	Blender Pump 5+1		
NJ3	Multi-hose Blender Pump 3+1 Grade 8-hose		

Notes:

- *W = Product 1 (**On Blenders only** Product 1 is **always** Lo Product)*
- *X = Product 2*
- *Y = Straight/Unblended Product Inlet*

Encore Pump Blender Piping to Hose Fitting Configuration

Figure 5-10: Pump Blender Piping to Hose Fitting Layout



6 – Installing Units on the Island

Mounting the Unit to the Island

Before placing the unit on an island, determine the correct location of piping for the unit involved and verify the proper orientation of the unit. A common installation error is to install the unit backwards, resulting in required modifications or delay in installation.

Mount the unit using mounting bolt locations specified.

Fill in any openings from the smaller length Encore cabinet to the potentially longer pit box opening for the Advantage wide frame or other units. Seal as required.

Lifting Encore Units

⚠ WARNING

Lifting heavy equipment can be hazardous.

Equipment could fall and cause severe injury or death.

Use lifting equipment of proper capacity and factor of safety when moving or positioning the unit. Stand clear from pump/dispenser when lifting and lowering.

Before mounting the unit to the island, verify if this pit box and unit base are compatible. Some pit box plates have rain lips that require modifications before placing the Encore unit on the plate. If the Encore unit will not fit properly onto the pit box plate, the unit will have to be lifted according to the instructions in this section and moved to a safe work area. Refer to "Encore Elevation Diagram (Encore 550 with SMART Meter)" on page A-11 and "Encore Elevation Diagram (Encore 500 S with SMART Meter)" on page A-12. If this modification is not required, do the following, and then proceed to the section "Before Mounting the Unit on the Fuel Island" on page 18.

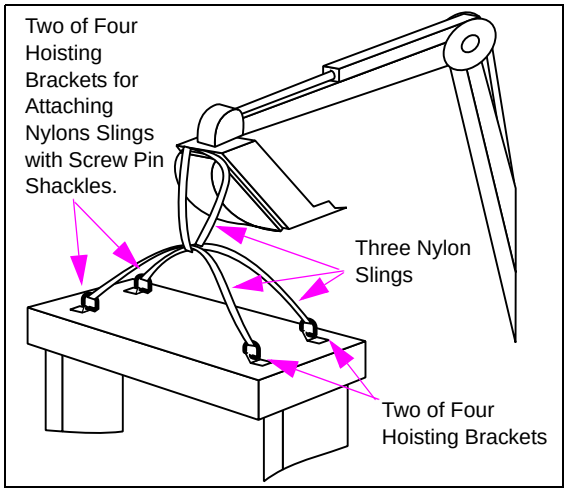
To lift Encore units, proceed as follows:

Note: Encore Series units have hoisting brackets mounted on top of upper housing.

1 Verify if the hoisting brackets are tight. Use the bolts provided with the brackets or grade 8 bolts.

2 Use three nylon slings (safety lift factor of 5) and four screw pin shackles along with hoisting brackets to lift the unit onto the island. See Figure 6-1.
Note: Do not run slings around columns or under the upper piping housing. This will damage the columns or sheathing.

Figure 6-1: Lifting with Hoisting Brackets


Two of Four Hoisting Brackets for Attaching Nylons Slings with Screw Pin Shackles.
Three Nylon Slings
Two of Four Hoisting Brackets

3 Lift and position the unit to the work area for modification or onto the island.
Note: If a side column conduit is used, take special care to avoid damage to the conduit when lowering the dispenser to the island.

4 Remove the slings and shackles.

Determine the Unit Side and Type

Before lifting the units onto the island, note the following:

- For units manufactured before January, 2003, model labels are located on Side 1. For units manufactured after January, 2003, the FCC/Patent labels are located on the inside sheathing on the right when facing Side 1.
- Refer to the unit model label to determine if the unit to be installed is MPD (dispenser or pump) or Blender (dispenser or pump).
- Use the following table to locate the appropriate configuration for your unit.

For This Configuration	Proceed To
Dispenser (MPD)	"Dispenser (MPD) Configuration" on page 23.
Pump (MPD)	"Pumps (MPD) Configuration" on page 28.
Dispenser Blender	"Dispenser Blender Configuration" on page 30.
Pump Blender	"Pump Blender Configuration" on page 33.
Pump STP	"J-Box and J-Box Conduit Installations" on page 52.
Pump Self Contained	"Connecting to the In-station Diagnostic (ISD) Vapor Flow Meter" on page 72.
Ultra-Hi Dispenser	"Ultra-Hi Configuration" on page 26.
Encore Foundation 1 to 6	"Encore Foundation Diagrams: 1 of 7 (Encore 300/500 Dispensers)" on page 2.
Encore Foundation (SMART Meter) 1 to 2	"Encore Elevation Diagram (Encore 550 with SMART Meter)" on page 11.

Connecting Pump/Dispenser Inlet Pipes

⚠ WARNING

Flexible fuels such as Biodiesel, high alcohol percentage fuels, and so on may be incompatible with certain plumbing materials and hydraulic components.

Use of incompatible materials or components with alternative fuels can result in leaks or unexpected failures of components resulting in fire or explosion or environmental damage.

When dispensing alternative fuels, verify with the manufacturer of the material or component that all plumbing components are compatible with the fuel being dispensed. Do not replace dispenser or pump parts with those incompatible with the fuel involved.

⚠ WARNING

Shear valves must be installed correctly.

Improperly or insufficiently anchored shear valves can lead to fire or explosion that could result in severe injury or death.

Anchor all shear valves per the manufacturer's instructions.

Note: Pumps do not have to use shear valves, except in special circumstances. The following procedure for a pump is identical to that of a dispenser, except that a shear valve may not be used. The contractor must provide and install pipe unions whether shear valves are used or not.

IMPORTANT INFORMATION

NPT pipe threads can at times be difficult to seal during installation or later, because of various conditions such as minor thread damage, contamination, slight thread imperfections, poor assembly practice and other reasons. Gilbarco has found that although NPT threads can be sealed normally with a good quality pipe sealant alone (the normal recommendation), on many occasions, fewer issues are created during installation by using a combination of sealant and Teflon pipe tape. The additional expense incurred to apply both will save money for the installer in the long run by spending less time correcting leaks during installation.

When using a Teflon pipe tape, it is extremely important to apply it properly so that no tape stringers are created to enter the hydraulic system. Tape stringers can cause serious issues with valves, nozzles, and other hydraulic components. Refer to "Inlet Pipe Assembly" on page 40 for information on how to properly use the Teflon pipe tape and thread sealant to ensure fewer installation issues and fewer subsequent pump/dispenser problems.

This information and recommendation does not apply to hanging hardware connections. Damage to aluminum parts of the hanging hardware or dispenser could occur since it is very difficult to control proper torque tightening because of the thread-assembly friction characteristics of Teflon tape.

To connect pump/dispenser inlet pipes, proceed as follows:

1 Remove the vertical low hydraulic cabinet brace (found only in some units) to gain access during the installation of plumbing. Reinstall this brace after you complete the installation of the plumbing.

For units with a shear valve, a contractor-provided union must be installed on the shear valve. Refer to the shear valve manufacturer's instructions for proper tightening of the union to the shear valve. For units without shear valves, a contractor-provided union must be installed on the ground stub pipe.

See Figure 6-4 on page 41 for additional shear valve information. Since Ultra-Hi units require special considerations, ensure that you read and understand the information on shear valves later in this section for those units.

CAUTION

Shear valves or other dispenser components can be damaged or broken if improper wrench techniques are used. The installer must use two wrenches so that stress is not applied to the shear portion of the valve during tightening.

2 To maximize installation versatility or ease, Standard Encore Series units are shipped without inlet piping, and Ultra-Hi units are shipped with inlet plumbing. The installer provides and installs the plumbing in the lower Hydraulics Cabinet when necessary. Where required, use a UL-approved sealant suitable for the applicable fuel type.

CAUTION

Units used with alternative fuels such as ethanol, Biodiesel or others require contractor-supplied plumbing components to be suitable for use with such components. Consult your part suppliers for recommendations for their hydraulic parts based upon the fuel types to be utilized.

Fuel leaks or component failure may occur if the components are not compatible with these fuels.

3 Ensure that you remove any shipping plugs or caps that may be present in pipes, shear valves and unions. Leave the mounting bolts a little loose at this time to allow more adjustment when aligning the piping.

Notes: 1) The contractor-supplied pipe and fittings must be 1-1/2 inch NPT Schedule 40 black iron. The Ultra-Hi pipe and fittings must be 2-inch NPT Schedule 40 black iron. Vapor Recovery is 1-inch NPT.

2) Flexible pipes are not allowed within the dispenser.

Consult the Local Regulatory Agencies for information regarding the valves or shear valves required for vapor recovery return lines.

To ensure proper operation of the shear valve during a vehicle collision, all piping above the shear valve must be secured to the lower cross brace using U-bolts sized according to the plumbing involved.

Inlet Pipe Assembly

To ensure proper sealing during installation, assembly of pipe nipples to all 1-1/2 inch NPT inlet tubes should follow the following guidelines.

- Ensure that the threads are of good quality, full-NPT threads without obvious damage for all pipe nipples.
- Assemble using 1/2-inch width Teflon thread-seal tape.
- Assemble using a high quality, UL-approved sealant that will not harden or wash out with the fuel being dispensed. Use Loctite® PN 56747 (TM 567) PST Pipe Sealant with PTFE (also know as Loctite 567) or equivalent.

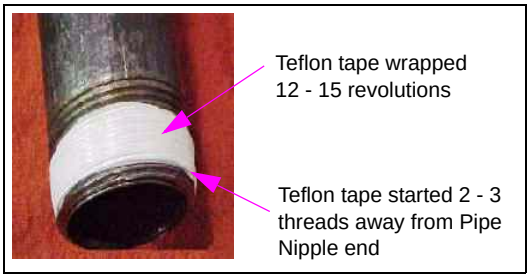
To assemble the inlet pipe assembly, proceed as follows:

1 From the pipe nipple end (about 2 to 3 threads), wrap the inlet pipe with Teflon tape (12 to 15 revolutions). See Figure 6-2.

CAUTION

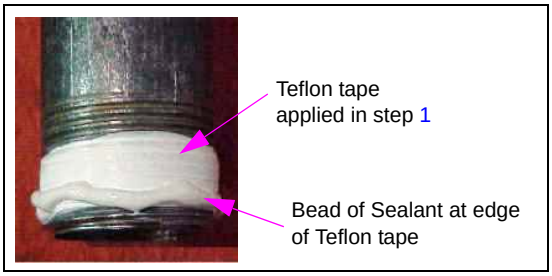
Do not use tape at the very end of the pipe nipple to avoid tape entering the dispenser hydraulics. Tape in the hydraulics can cause failures of valves, nozzles or other significant problems.

Figure 6-2: Inlet Pipe Wrapped with Teflon Tape



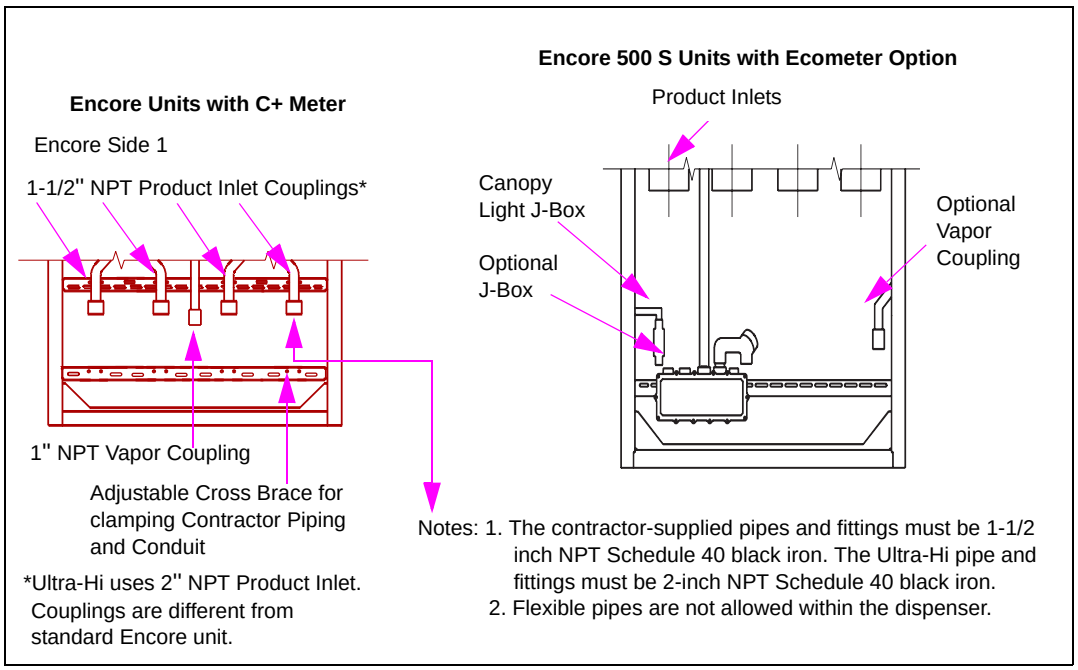
2 Apply a moderate bead of sealant completely around the nipple end at the edge of the Teflon tape. See Figure 6-3.

Figure 6-3: Bead of Sealant at Edge of Teflon Tape



3 After the sealant has been properly applied, tighten the connection to 130 foot-pounds.

Figure 6-4: Dispenser Inlet Piping and Safety Brace


Encore Units with C+ Meter
Encore Side 1
1-1/2" NPT Product Inlet Couplings*
1" NPT Vapor Coupling
Adjustable Cross Brace for clamping Contractor Piping and Conduit
*Ultra-Hi uses 2" NPT Product Inlet. Couplings are different from standard Encore unit.
Encore 500 S Units with Ecometer Option
Product Inlets
Canopy Light J-Box
Optional J-Box
Optional Vapor Coupling
Notes: 1. The contractor-supplied pipes and fittings must be 1-1/2 inch NPT Schedule 40 black iron. The Ultra-Hi pipe and fittings must be 2-inch NPT Schedule 40 black iron.
2. Flexible pipes are not allowed within the dispenser.

⚠ WARNING

Always use the provided adjustable cross brace to secure plumbing in the dispenser, or the shear valve may not operate properly during a vehicle collision.
The cross brace is not an optional feature!
Also, use of non-rigid piping materials such as field-bendable tubing to connect to the inlet may also result in the shear valve not operating properly during a collision.
Use of black iron pipe inside the dispenser is required for fuel lines at the outlet of the shear valves.

4 Loosely connect the union halves together.

CAUTION

Do not use pry (crow) bar to position dispenser/pump over conduit or pipes. This could damage valves, conduit or other parts of the unit.

5 Double-check the alignment of the frame, conduit and pipes. Secure the piping to the safety brace using U-bolts or pipe clamps that are supplied by the contractor.
Note: Misaligned piping could result in a leak.

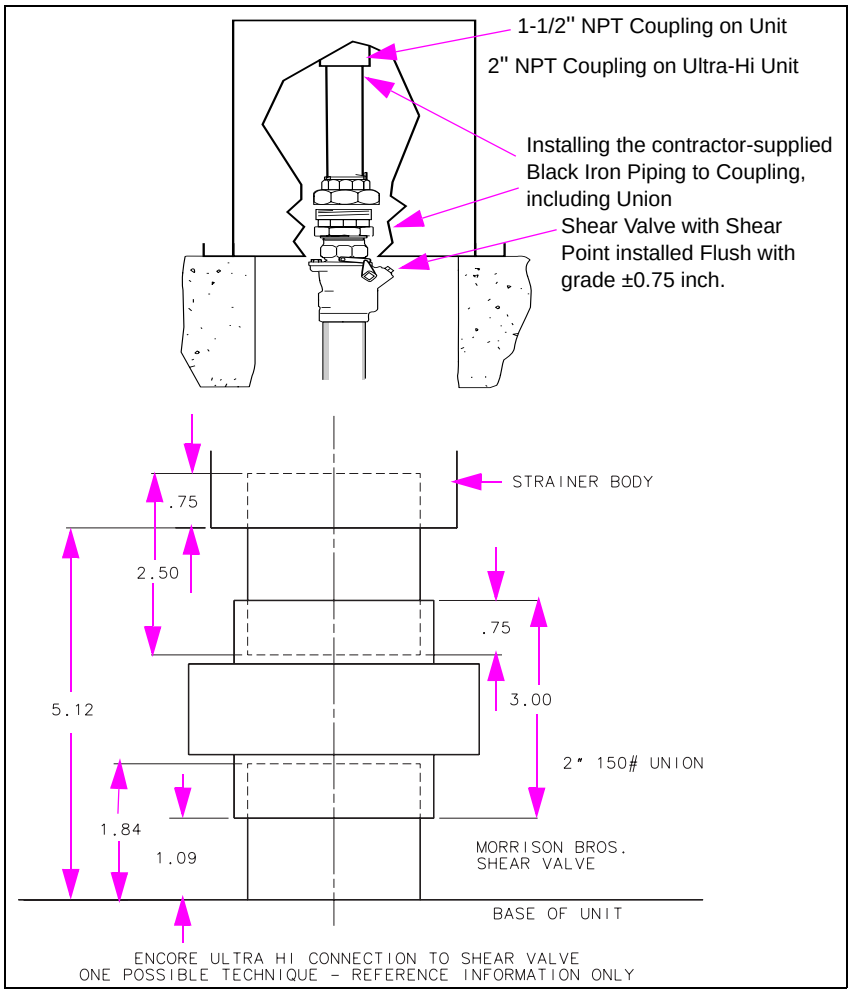
⚠ WARNING

For Ultra-Hi units, do not permanently remove the strainer under any circumstances to accommodate shear valves from certain manufacturers that may not properly position the shear section of the valve as shown in Figure 6-5.

Use a Morrison or equivalent shear valve to ensure proper position of the shear section of the shear valve.

Failure to use the strainer could result in failure of the valves or meters, void warranty and create a safety hazard with an improperly operating valve.

Figure 6-5: Shear Valve at Grade



Notes: 1) Regular (non-double wall) shear valve is shown.

2) OPW supplies an Encore Ultra-Hi compatible double poppet shear valve with a union top (OPW part # 10RUP-2006).

3) It is a mandatory code requirement that the shear section of the shear valve be within +/- 3/4-inch (or to shear valve manufacturer's requirement, whichever is tighter) from the plane of the bottom of the base of a dispenser. Not all shear valve styles allow the maintenance of this tolerance for Encore Ultra-Hi units. A N23047 single poppet male top Morrison 2x2 636M-0200AV or a code-approved equivalent shear valve meets the code requirements. Do not modify the dispenser plumbing (for example, remove the strainer housing) to accommodate other model valves or install units such that the shear groove of the shear valve is not within +/- 3/4-inch of the base plane of the dispenser. Use a N23274 Check Valve between the union and strainer housing to ensure that the shear section is properly located.

6 Tighten the union halves together.

7 Tighten the anchor bolts at this time. Verify is the shear valves are properly tightened to the pit box or shear valve anchor bracket as required. If removed earlier, reinstall the vertical cabinet brace in the lower hydraulic cabinet.

For Ultra-Hi installations:

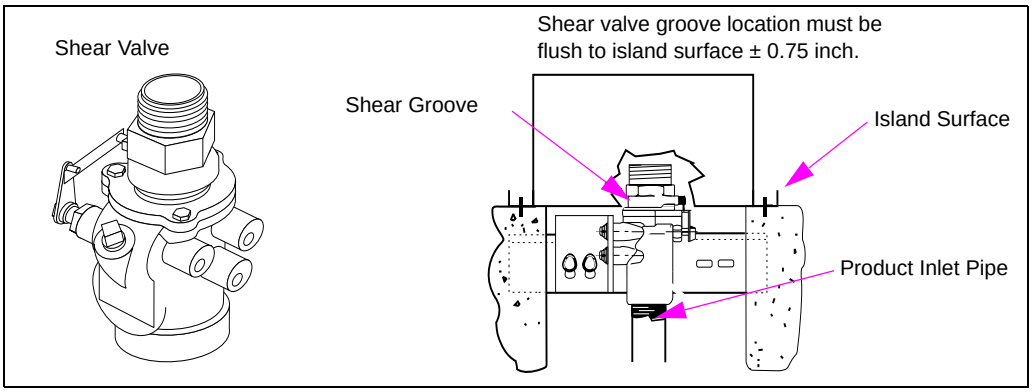
- Selection of proper components mounted to the bottom of the strainer housing is critical in maintaining the proper location of the shear valve groove of the shear valve to the base plane of the dispenser. You must follow the shear valve manufacturer’s required positioning for this groove.
- A check valve is strongly recommended. When installed, Gilbarco recommends using N23274, which is approximately 2.5 inches long and can take the place of the close nipple located above the union. Failure to install a check valve here could result in fuel sale indication when the fueling position is activated with the nozzle closed and the check valve back at the STP is leaking.
- A union is required above the shear valve.
- A Morrison male end shear valve N23047 (Morrison # 636M-0200AV) can be used to properly maintain the position of the shear groove. The installer should verify if other manufacturer’s shear valves would ensure proper positioning of the shear groove per their specifications.
- Not all double poppet shear valve models or styles will fit the Ultra-Hi.
- Other combinations of unions, check valves, and shear valves may be possible and still maintain proper location of the shear groove.
- Removal of a strainer from the system will void warranty.

Follow the shear valve manufacturer’s instructions for installation procedures, testing, and so on.

- Install the shear valve on each product inlet pipe.
  Note: Encore dispensers require 1-1/2 inch male top shear valves. Gilbarco strongly recommends using double poppet shear valves that shut off flow from both storage tanks and internal to the unit (for example, OPW #10BHMP or Exxon - OPW # 10RMSP). The Encore Ultra-Hi dispensers use 2-inch male top shear valve (for example, Morrison Bros. 2-inch 636 m).
- For Ultra-Hi units, install the shear valve on each 2-inch inlet and outlet.
- Install a shear valve on the master dispenser satellite outlet and at satellite inlet.
- Do not mount the shear valve upside down.

- Ensure that the valve linkage is accessible and has no interference to open or close from other piping, structure or components.
  Note: The dispenser product inlet pipes need to be aligned with the shear valve. Do not restrict shear valve linkage with pipes, braces, and so on.
- Test shear valve operation.
- Close shear valve until equipment start-up. Cap the inlet pipe. This prevents dirt and other particles from getting in the product line. It also prevents fuel spillage.

Figure 6-6: Shear Valve


Shear Valve
Shear valve groove location must be flush to island surface ± 0.75 inch.
Shear Groove
Island Surface
Product Inlet Pipe

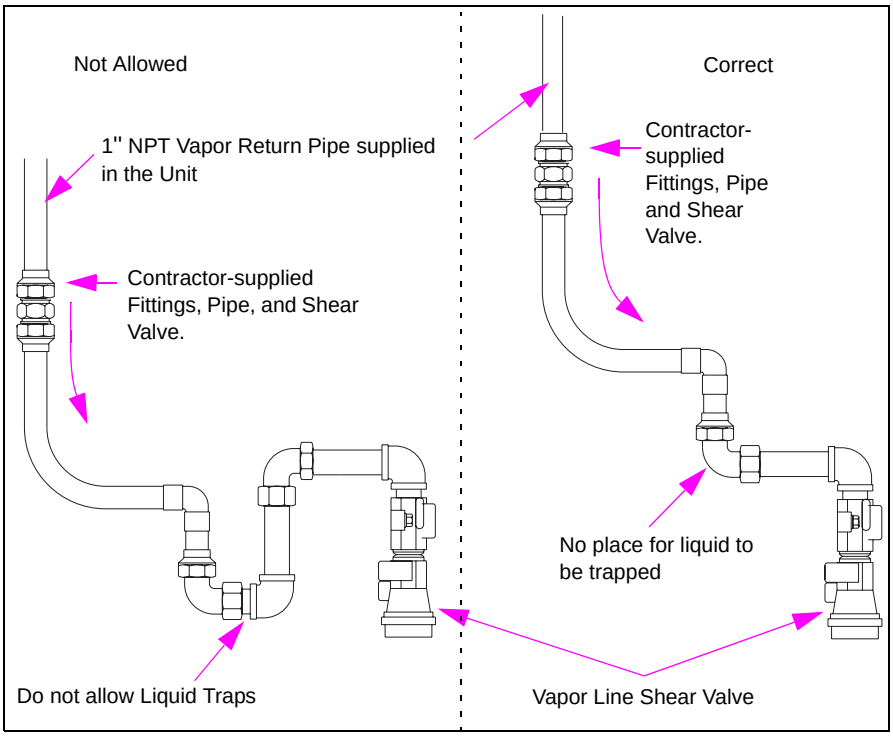
Connecting the Vapor Return Line to the Vapor Shear Valve

Do not create any liquid traps when connecting the vapor return line to the vapor line shear valve. See Figure 6-7. A liquid trap is a low spot in the vapor return line that can accumulate fuel and cause blockage, which could cause a system to fail vapor recovery certification tests or create operation issues with vapor balance nozzles.

Notes: 1) The contractor must provide and install the pipe union for connecting to the 1-inch NPT coupling in the unit.

2) Follow the vapor shear valve's manufacturer information regarding mounting of the shear valve to the unit.

Figure 6-7: Correct Vapor Line Connection Method


Not Allowed
1" NPT Vapor Return Pipe supplied in the Unit
Contractor-supplied Fittings, Pipe, and Shear Valve.
Do not allow Liquid Traps
Correct
Contractor-supplied Fittings, Pipe and Shear Valve.
No place for liquid to be trapped
Vapor Line Shear Valve

Anchoring the Pump/Dispenser to the Island

Note: Pumps do not normally require shear valves. The following procedure for a pump is identical to that of a dispenser, except that the shear valve may not be used.

⚠ WARNING

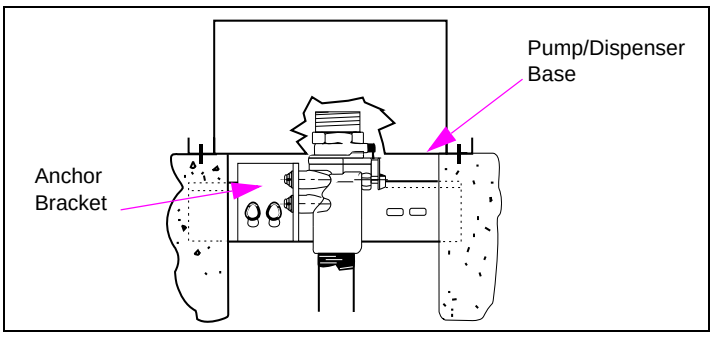
Improper anchoring of units could cause damage, severe injury or death resulting from the unit tipping over from the impact or drive-off.

NFPA 30A requires the anchoring of pumps/dispensers.
Securely install anchor bolts at all anchoring locations as shown on foundation diagrams for safe operation of shear valves and hose breakaways.

To anchor pumps/dispensers to the island, proceed as follows:

1 Verify if the shear valves are firmly anchored to the island form (concrete or pit box). See Figure 6-8.
Note: If the shear valve is not anchored properly, it may not operate correctly during a severe impact. Follow the shear valve manufacturer's instructions.

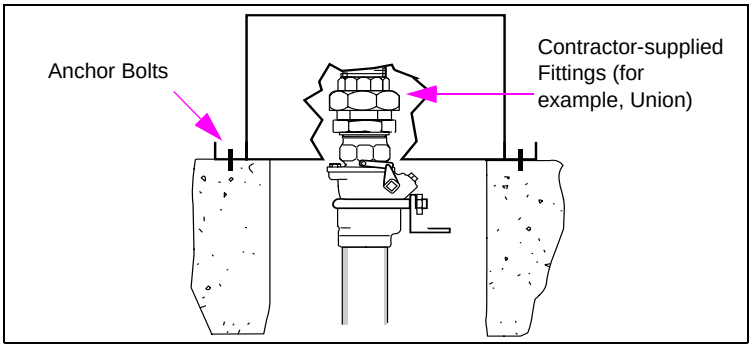
Figure 6-8: Anchoring Shear Valve using Anchor Brackets



2 Loosely anchor the pump/dispenser to the island according to the foundation layout locations, using all the required anchoring points as follows:

- Use 1/2-inch anchor studs with heavy duty large washers (slot designed for that size).
- Use bolts or studs that are of grade 5 steel.
- Use hardware that is corrosion-protected or resistant.
  Note: Do not use plastic, low strength, or pallet bolts.
- Studs/bolts must be securely anchored to the island or pit box. See Figure 6-9.
- See the anchor or pit box manufacturer's instructions for additional important information.

Figure 6-9: Anchors for Pump/Dispenser



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7 – Installing Conduit and Wiring in Unit

Installation of Conduit Within the Unit

Standard Encore units are not shipped with the J-Box. All electrical runs for Encore units are to be provided at the site by the installer unless a J-Box is ordered for the unit. Conduit may be routed through the dispenser pit box or external to the pit box through the side column. The instructions in this section also contain one additional possible approach to routing conduit into the dispenser versus through the dispenser pit box. Side entry to the Electronics Cabinet bottom eliminates the necessity to penetrate the pit box with conduit and the potential cost and reliability issues.

Note: Gilbarco does supply J-Box kits. For information on how to order a J-Box, contact a Gilbarco Customer Service Representative at 1-800-800-7498 (US and Canada). For additional information on J-Box kits, refer to MDE-4084 Junction Box Retrofit Kit M01483K006 Installation Manual.

⚠ WARNING

All standard safety precautions for hazardous locations are to be followed and maintained while this work is being performed.

Do not use electrically powered (battery or corded) tools in the work area.
Do not smoke or allow open flames in work area.
Always remember to power down all circuits before performing work.

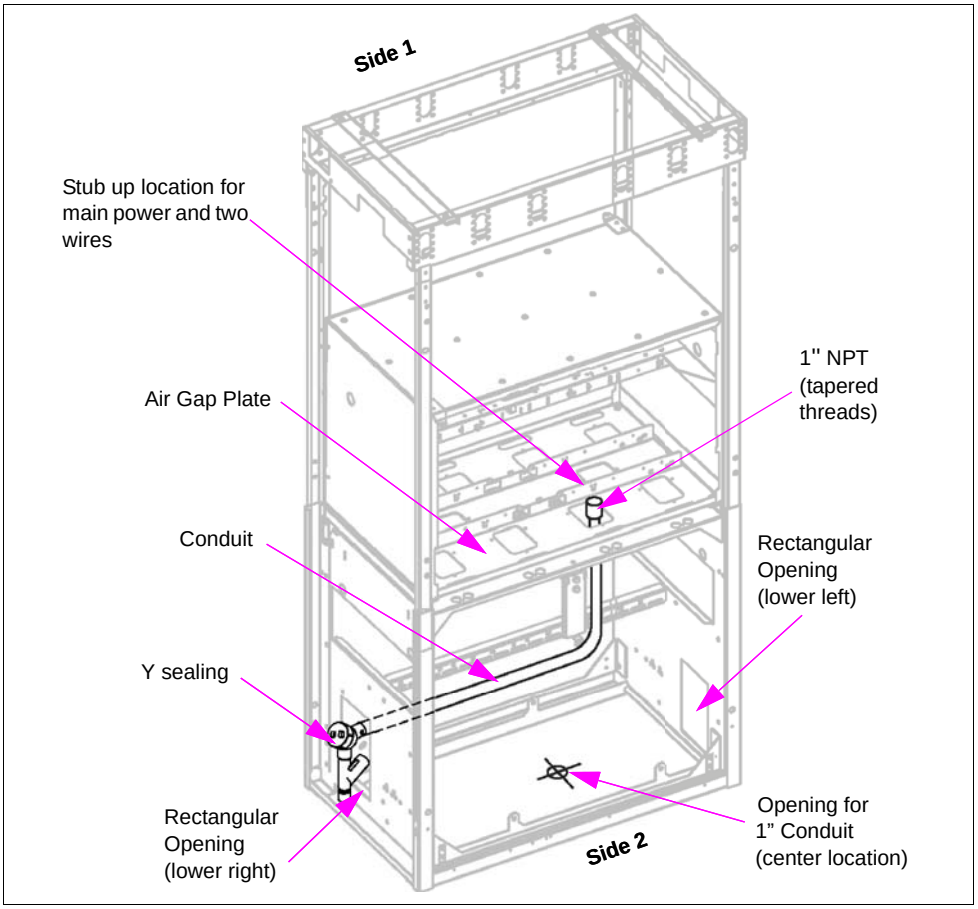
Failure to following these precautions may result in serious injury or death.

The instructions given below are for adapting conduit rising from the right of the pit box when facing Side 1 (or left when facing Side 2). Also shown is the option where the conduit penetrates the pit box.

Field wiring through the side column location can be installed as follows:
Note: These instructions are for units without pre-installed J-Boxes.

1 On the lower right corner of the frame end, locate the rectangular opening. See Figure 7-1.

Figure 7-1: Encore Frame Assembly with Conduit



Note: Each end has an opening which is diagonally opposite to another opening. The opening can be used to pass the electrical conduit from the narrow space inside the column through the frame opening. The conduit is finally run through the air gap plates into the electronic module in the location shown in Figure 7-1.

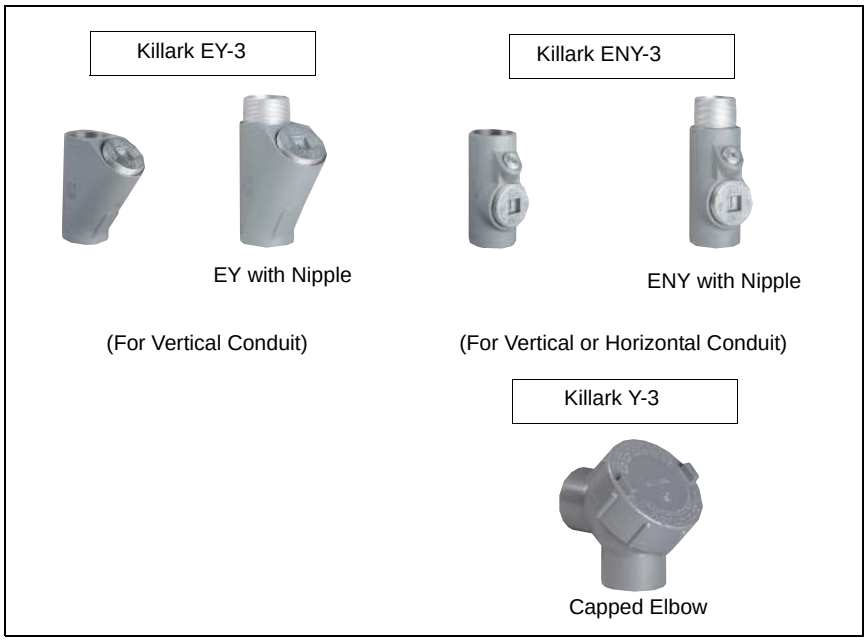
2 For side column entry, run the field wiring conduit through a 1-inch trade size conduit stub up centered in the width of the rectangular opening of the column.

3 For side column entry, stub up must be inside the column and centered in the column as closely as possible.
There is very little extra room with 1 inch fittings. See Figure 7-1.
Note: If stub up is not properly located in the column, it will interfere with the column outer sheathing.

4 For side column entry, use a 1-inch trade size conduit stub up long enough to extend at least 1-inch above the lower edge of the rectangular opening.

5 For side column or pit box entry, thread the end of stub up using a 1-inch NPT (tapered threads) in order to use a sealing fitting. The use of a Killark EY-3 or Killark ENY-3 is recommended. These fittings are compact and will fit inside the column. See Figure 7-2.

Figure 7-2: Killark Fittings



6 For side column or pit box entry, install the sealing fitting to stub up. Tighten all fittings (minimum five full threads of engagement).

J-Box Installation

J-Box Specifications

Encore units are provided without the J-Box unless the J-Box option is specified at the time of order. Units sold in Canada are provided with a J-Box. If you are replacing an existing unit, the installing contractor may connect and extend the existing field wires that are too short for Encore by providing and utilizing a Class 1 Division 1 explosion-proof J-Box sized to conform to or exceed the requirements of both UL 87 and the National Electrical Code NFPA 70.

Notes:1) These specifications may have requirements that are not identical.

2) Gilbarco supplies J-Box kits. Refer to MDE-4084 Junction Box Retrofit Kit M01483K006 Installation Manual for additional information.

J-Box and J-Box Conduit Installations

This section covers information regarding units installed with factory J-Boxes or units with contractor installed J-Boxes. J-Boxes are commonly used when adapting units to existing field wiring and conduit or for Canadian installations. Depending on the installation, the electrician routes the conduit directly to the Electronics Cabinet, to a factory-installed J-Box, or to an installer-supplied J-Box and then to the Electronics Cabinet.

Notes:1) For Encore units that are replacing older units, if the existing wire is too short to reach the cabinet connections and a splice must be made, the contractor must provide and use a Class 1 Division 1 explosion-proof J-Box to make connections according to code. Refer to *"Before Mounting the Unit on the Fuel Island" on page 18.*

2) Up to two J-boxes may be required per unit depending upon the equipment involved and existing wiring. One will be required for power and two wire communications to the unit and the other for non power wiring such as speakers, call buttons, and so on.

3) Factory equivalent J-Box kits are also available from Gilbarco.

To install the J-Box and related conduit, proceed as follows:

1 Open the CIM door on Side 1 of the unit. Refer to MDE-3804 Encore and Eclipse Service/Start-up Manual for instructions.
Note: Side 1 has electronics module access to the field connections, boards, and wiring. The main J-Box is installed on Side 1 for units with a factory-installed J-Box.

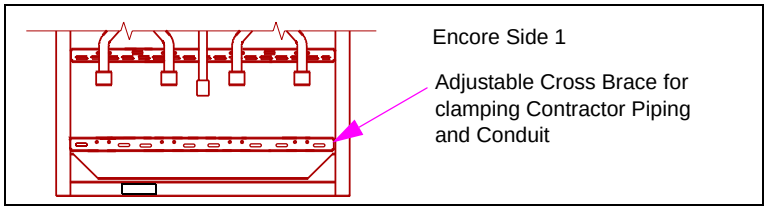
2 For units with the J-Box installed, remove the box cover and retain for reassembly.

3 Verify if a Seal-off Y fitting has been installed and sealed as a first connection where the conduit leaves the ground. This fitting must be in place and sealed before proceeding further. For additional information, refer to MDE-3802 Encore and Eclipse Site Preparation Manual.

4 In all units where the J-Box is used (factory or contractor-supplied), the following are mandatory requirements:
- The connection of the conduit to the J-Box must be made with a clearance of at least 9 inches from the pump/dispenser base to the bottom of the J-Box connection stub. To accomplish this, the conduit can be routed to enter the J-Box from the side or top.
- The J-Box must be securely fastened to the unit by means of a bracket or brace. It should not be held in place only by a conduit. Factory-supplied boxes are fastened only by a conduit.
- Installation of the J-Box and all fittings must be done to allow the installer to turn any and all threaded fittings by a minimum of 45° in a single movement using appropriate tools (for example, pipe wrench).

5 The contractor must provide sufficient number of properly sized U-bolts or pipe clamps to securely fasten all conduits running through the Hydraulics Cabinet to the braces provided. See Figure 7-3.

Figure 7-3: Cross Brace (without Ecometer Option)



IMPORTANT INFORMATION

Always use the adjustable cross brace provided to secure the conduit in the dispenser. The lower brace is not an optional feature.

6 For units with the J-Box, run a 1-inch rigid conduit to the J-Box entering the unit from Side 2. Run any existing wiring to the main J-Box through the 1-inch J-Box conduit that enters the unit from Side 2. Make connections to the 1-inch conduit with Class 1 Division 1 explosion-proof conduit union.

If the conduit is entering the unit from outside the dispenser pit box, refer to "Electrical Related Items" on page 83 and "Reference Information" on page 91 before proceeding.

Use an 8 inch long by 1 inch diameter conduit, to run to the Electronics Cabinet of the unit from Side 2. Use additional conduits and coupling, if required.

7 If required, install the conduit for call buttons, Ethernet, and speaker wires using similar procedures as outlined for the power conduit. However, when facing Side 1, call button, and so on, conduit must be to the right side of the unit and power wiring to the left. Ensure that you follow earlier steps and warnings for installing the conduit through the air gap plate or side of the Electronics Cabinet. If the unit requires a call button conduit, read and understand "Installing the Call Button/Speaker Conduit" on page 67. If the unit contains a lighted canopy, read and understand "Lighted Canopy Conduit and Wiring Options" on page 69.
Note: Call button, Ethernet, and speaker wires cannot be in the same conduit as the power and two communication wiring to the unit. They must be in a separate conduit.

8 If the unit is equipped from the factory with a Call Button/Speaker Junction Box and Conduit, refer to wiring requirements in "Installing the Call Button/Speaker Conduit" on page 67.

Preparing J-Box Field Conduit

To prepare the field wiring, proceed as follows:

1 Open the CIM door on Side 1 of the unit. Refer to MDE-3804 Encore and Eclipse Service/Start-up Manual for instructions.
Note: Side 1 has electronics module access to the field connections, boards and wiring. The main J-Box is installed on Side 1 for units with or without a factory-installed J-Box.

2 Commonly, a field connection conduit runs through the side column to the J-Box with a 1 inch NPT male end. Run all the field wiring through this field conduit. All wiring connections may take place in the factory-installed J-Box. Refer to "Electrical Related Items" on page 83 and "Reference Information" on page 91 before proceeding.

3 In all units where a J-Box is used (factory or contractor-supplied), the following are mandatory requirements:
- The connection of the conduit to the J-Box must be made with a clearance of at least 9 inches from the pump/dispenser base to the bottom of the J-Box connection stub. To accomplish this, the conduit can be routed to enter the J-Box from the side or top.
- The J-Box must be securely fastened to the unit by means of a bracket or brace. It should not be held in place only by a conduit. Factory-supplied boxes are fastened only by a conduit.
- Installation of the J-Box and all fittings must be done to allow the installer to turn any and all threaded fittings by a minimum of 45° in a single movement using appropriate tools (for example, pipe wrench).

⚠ WARNING

The bottom plate of the Electronics Cabinet and the top plate of the Hydraulics Cabinet are separated to provide an air gap between the electrical and hydraulic housings.

Loss of air gap integrity due to improper installation can allow fuel vapors into areas where they may ignite. The resulting fire and/or explosion can lead to serious injury or death.

Running the conduit through the air gap requires strict compliance with procedures outlined in this manual. No holes in air gap plates can be left unsealed following the installation.

⚠ WARNING

The Electronics Cabinet is an unclassified area and as such must be protected against flammable vapor entry.

Improper installation of the conduit through the side of the Electronics Cabinet may result in flammable vapors penetrating the Electronics Cabinet where it may ignite resulting in fire and/or explosion that can lead to serious injury or death.

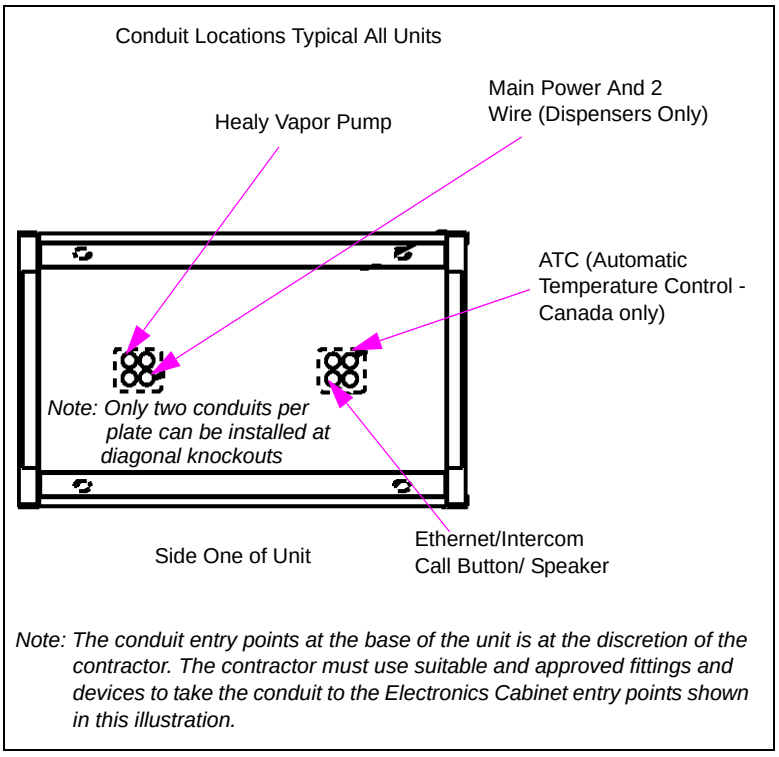
Running the conduit through the side of the Electronics Cabinet requires strict compliance with the procedures outlined in this manual.

IMPORTANT INFORMATION

For conduit entry through the Vapor barrier, the air gap penetration conduit should not be longer than 8 inches. This will allow removal of the dispenser (if necessary) in the future and accommodate wiring a new dispenser without pulling new wire.
When a dispenser without a J-Box is removed from the island, the conduit and wires will be cut immediately below the potting dam. This will leave enough wire to splice into a Class 1, Div 1, Group C and D explosion-proof J-Box when a new (or previously removed) unit is installed/reinstalled over the containment box.

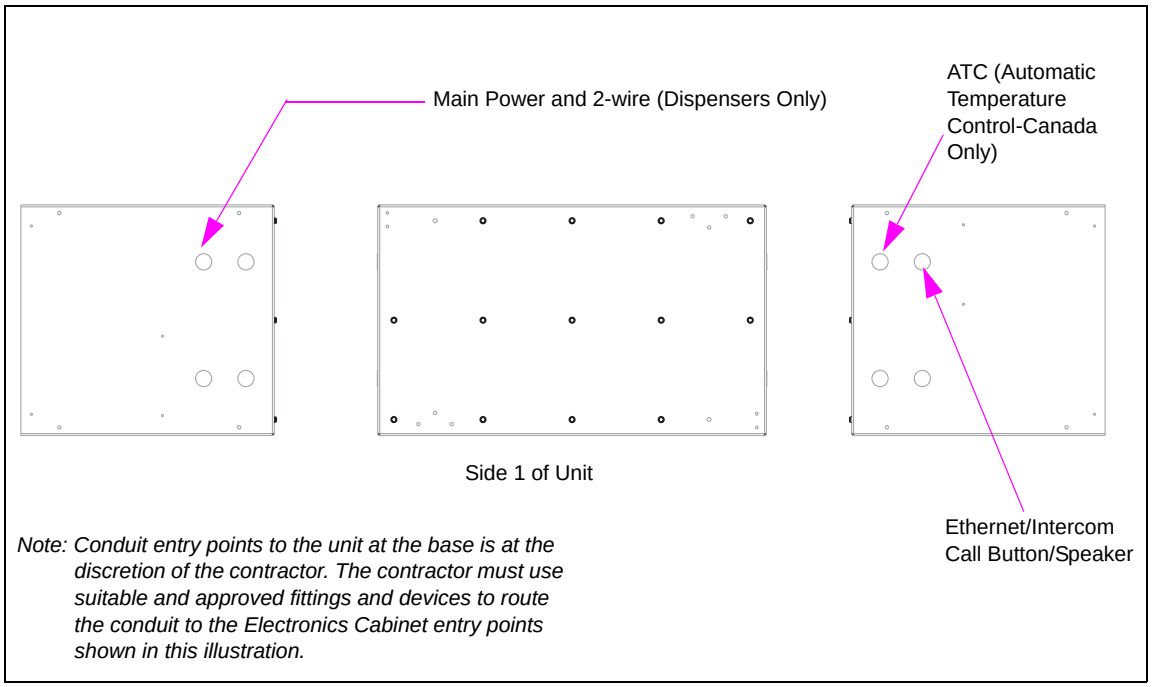
Use the information provided in Figure 7-4 to feed wires into the Electronics Cabinet.

Figure 7-4: Typical Conduit Locations (Entry through Air Gap)


Conduit Locations Typical All Units
Main Power And 2 Wire (Dispensers Only)
Healy Vapor Pump
ATC (Automatic Temperature Control - Canada only)
Note: Only two conduits per plate can be installed at diagonal knockouts
Side One of Unit
Ethernet/Intercom Call Button/ Speaker

Note: The conduit entry points at the base of the unit is at the discretion of the contractor. The contractor must use suitable and approved fittings and devices to take the conduit to the Electronics Cabinet entry points shown in this illustration.

Figure 7-5: Typical Conduit Locations (Entry from Side of Electronics Cabinet)


Main Power and 2-wire (Dispensers Only)
ATC (Automatic Temperature Control-Canada Only)
Side 1 of Unit
Ethernet/Intercom Call Button/Speaker
Note: Conduit entry points to the unit at the base is at the discretion of the contractor. The contractor must use suitable and approved fittings and devices to route the conduit to the Electronics Cabinet entry points shown in this illustration.

For conduit entry through the Vapor barrier, the Encore unit contains eight sets of conduit knockout holes (four on the right and four on the left) for access to the Electronics Cabinet. Knock out the aligned (top and bottom air gap plate) 1-inch plugs for the required number and positions of contractor-supplied conduits (do not use conduits smaller than 1 inch with the conduit plate provided). For field installations, only two conduits at opposite corners can be installed per plate. Use the knockouts on the left (facing Side 1) for all power and 2-wire connections. Ethernet, International Forecourt Standards Forum (IFSF), speaker, intercom and/or call button wiring should use knockouts on the right. For conduit entry through the side of the Electronics Cabinet, the Encore unit contains eight sets of conduit knockout holes (four on the right and four on the left) for access to the Electronics Cabinet. Knock out the 1-inch plugs for the required number and positions of contractor-supplied conduits.

Note: Do not use conduits smaller than 1 inch in size.

Installing Conduit through the Vapor Barrier

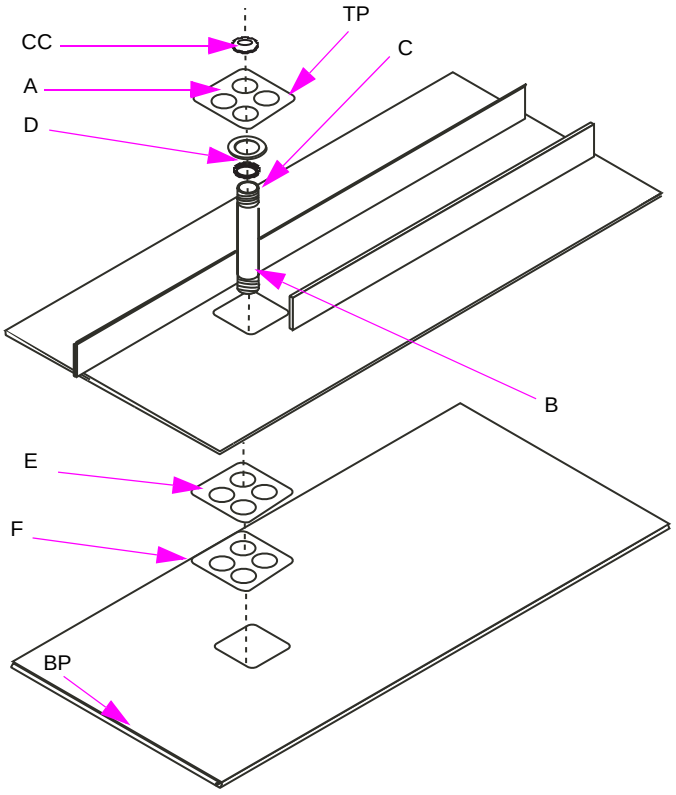
Note: This is not required for units with factory installed J-Boxes.

To seal the air gaps and conduits in Encore units, proceed as follows:

1 Install the contractor-supplied 1 inch by 8 inch listed metal, rigid, threaded conduit through both the top and bottom air gap conduit plate holes according to the following (see Figure 7-6):

- From the Electronics Cabinet, remove two screws (not shown) and the upper conduit plate (A) from the top air gap plate (TP). Retain all parts for reassembly.
- Thread ends of conduit (B) approximately 1-1/2 inch from each end.
  Note: The conduit can be installed to the top air gap conduit plate (A) away from the unit.
- Fasten the conduit (B) to the conduit plate (A) removed using a machined flat conduit lock nut (C) and washer (D) on the bottom of the plate (A). Fasten a listed, metallic conduit Capped Bushing (CC) on the top of the plate.
- Remove two screws (not shown) and bottom air gap conduit plate (E) from bottom air gap plate (BP). Save all for reassembly.
  Note: (Canada only) The gasket for plate (F) will come off with the plate. The gasket must be reinstalled with the plate.
- Remove the aligned knockout plugs from the bottom air gap conduit plate (E) as required, and reinstall the plate and screws.

Figure 7-6: Encore Conduit Sealing Plates



⚠ WARNING

Fuel vapors allowed to travel between the Hydraulics and Electronics Cabinets presents the risk of fire or explosion. The resulting fire or explosion may lead to serious injury or death. Never compromise the Vapor barrier integrity by leaving out conduit plates or open holes (for example, using conduit smaller than 1" diameter). For Canadian applications, do not leave out any gaskets. A listed metallic conduit capped bushing must be installed at the top of the 8" conduit for mechanical retention of potting in the event of explosion.

- From the Electronics Cabinet, slide the conduit down through the knockout in the bottom air gap plate.
- Reinstall the top air gap conduit plate (A) onto the top air gap plate using screws, to secure the conduit in place.

Installing Conduit through the Side of the Electronics Cabinet

Figure 7-7: Conduit Routing through Side Column into Electronics Cabinet

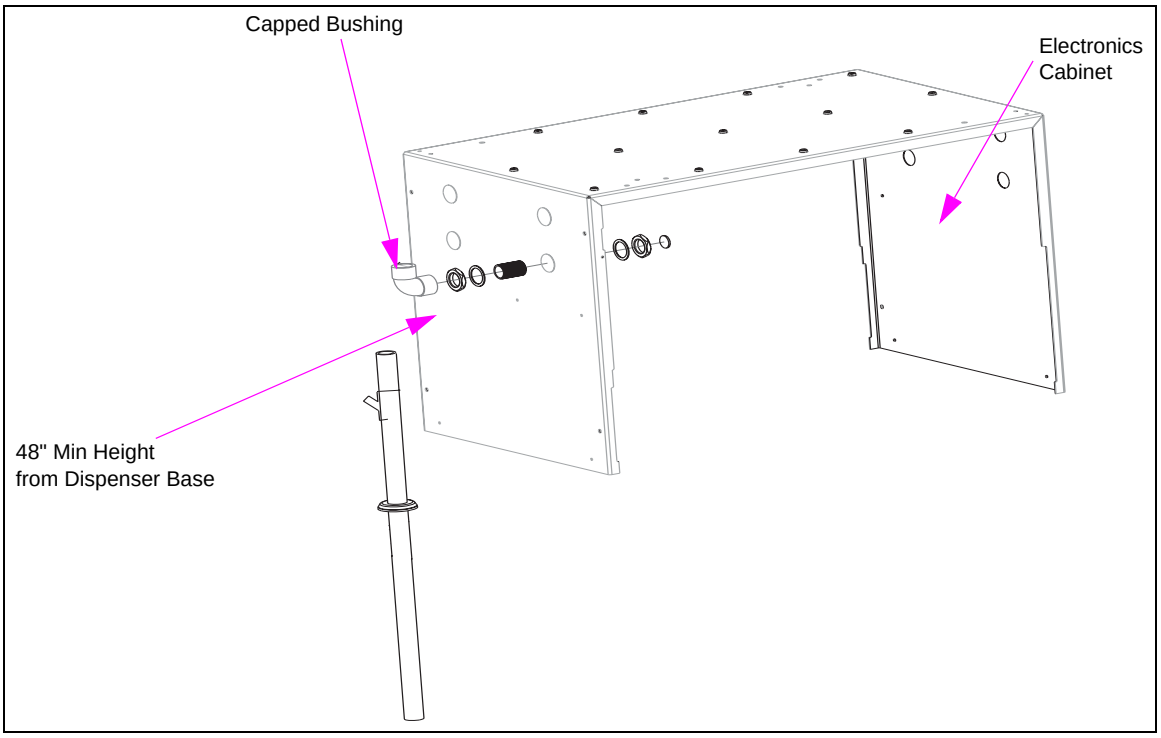
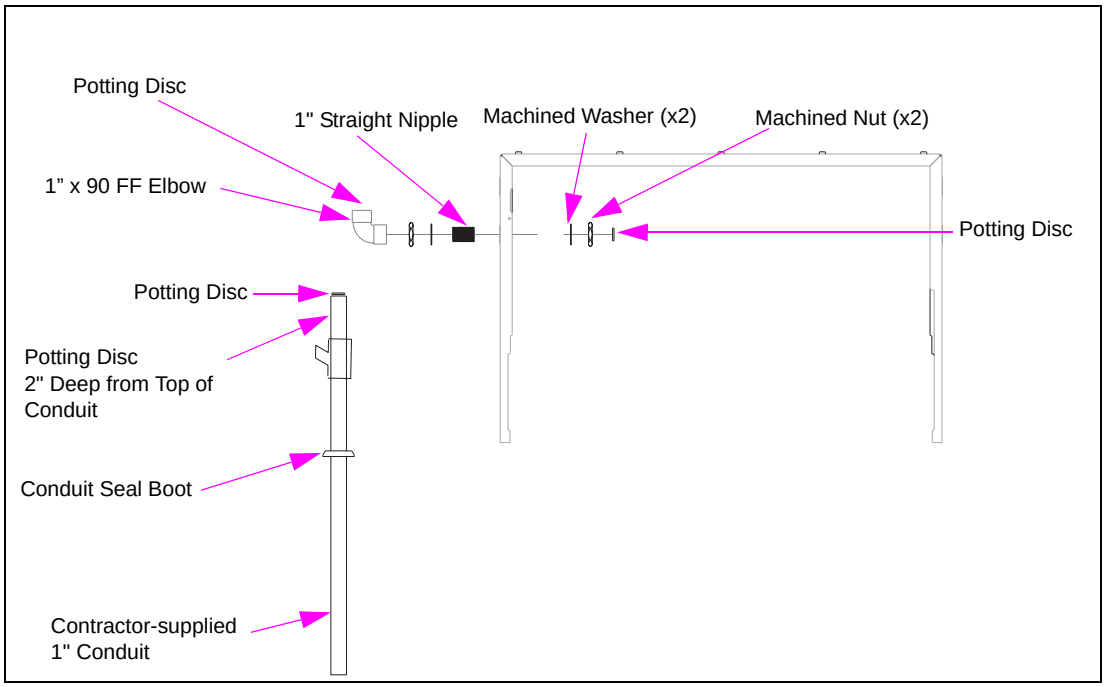


Figure 7-8: Conduits and Potting Discs



Notes:1) Conduit seal boots and liquid deflectors are not used on all dispensers.

2) Use UL-listed metallic conduit capped bushing for wire protection.

3) On dispensers without factory installed J-Box, run conduits for:
a) The power and two wire communications.
b) Speakers and call buttons (if required), and
c) SMART Connect (if required) through the side column into the Electronics Cabinet as shown in Figure 7-7 on page 58.

Installing Wiring

Notes:1) The wiring must be gas and oil-resistant, color-coded or tagged for identification purposes, and rated for 300 Volts or higher. Data wires for new installations must be a twisted-pair (unshielded) with 10 to 12 twists per foot.

2) Refer to the following documents for more information:
- *FE-353 Field Wiring Diagram Encore 550 Dispensers (all products)*
- *FE-363 Field Wiring Diagram Encore 500 (all products)*
- *FE-364 Field Wiring Diagram Encore 300 (all products)*
- *MDE-3802 Encore and Eclipse Site Preparation Manual*

Operating Environment

Environment	Range
Relative Humidity	20% to 95% non-condensing
Minimum outside ambient temperature	-22° F (-30° C)
Maximum outside ambient temperature	104° F (40° C)*

Operation under severe environmental conditions may require special options such as card reader heaters and so on, to ensure proper unit performance.

*Electronics have been evaluated and are rated for use at a maximum of 13° F (55° C) outside ambient temperature.

Load Table Reference Locations

Model	Unit	Field Wiring Diagram
Encore 300 Series	All products	FE-364
Encore 500	All products	FE-363
Encore 550	All products	FE-353

Heater Load Table

10.4-inch InfoScreen® Heater Option Load (Note)
6.6 AMP @ 120 VAC 60 Hz

Note: The heater will only cycle when it is cold and the unit is not in use.

Wiring External to the Dispenser

To install the wiring external to the dispenser, proceed as follows:

1 Pull the wiring through the stub up and sealing fitting.

Notes:1) Ensure that enough extra wire length (minimum of 5 feet or 2 meters) is provided in order to make the run to the stub up location at the bottom of the Electronics Cabinet.

2) Remember you may be routing the conduit over to come up at the stub up to the Electronics Cabinet. Depending on which end of the unit the stub up is on, you may be routing across the entire unit length.

2 For side column conduit entry, install a short 2-inch threaded nipple into the top of the sealing fitting.

3 For side column conduit entry, install a capped pulling elbow. The use of a Killark Y-3 fitting is recommended. See Figure 7-2 on page 51.

4 The remaining conduit must be made up to match the installation layout for the unit at the site. A list of the most common procedures for conduit entry to the right when facing Side 1 is given below.
   - The length of the conduit should extend straight out from the capped Y fitting or pulling elbow.
   - For side column entry, conduit should then turn 90°, vertical under the air gap plate knock out.
   - Use the required air gap plate knock out. Do not knock out any knock out plugs that will not be used as an opening for conduit.
   - All conduit that enters into the Electronics Cabinet must be potted.
   - At least 1 inch of conduit should extend above the bottom shelf of the Electronics Cabinet.
   - Complete the conduit run with a conduit nut on the inside of the cabinet.
   - Pull all wires properly through the conduit. Finalize the procedure by potting the conduit end.
   - Allow 18 inches of wire in the Electronics Cabinet for field connections. Wire will be trimmed as necessary upon field connection.

Testing New Field Wiring

⚠ WARNING

Sparks can ignite fuel/vapors.
Fire/explosion can result in severe injury or death.
Use caution when testing wires. Do not test when exposed fuel and vapors are present.
Only use a Megger® Tester on new field wiring.
For existing wiring, use a digital multimeter to test for continuity/resistance.

Test the insulation of new wiring from the station and to the Electronics Cabinet before connecting the wires. Refer to the Warning above. This checks for damage that can occur while pulling wires through the conduit.

To test the new field wiring, proceed as follows:

1 Ensure that wires are disconnected at both ends. If you do not disconnect wires at both ends, you can damage the pump/dispenser electronics.

2 Test the conduit wiring ends by using an insulation/Megger tester.

3 Connect one tester lead to the wire under test.

4 Connect the other tester lead to the ground.

5 Measure the resistance. Follow the test equipment manufacturer's instructions. Insulation resistance of more than 50 megohms is satisfactory. Check the local authority requirements.

6 Repeat steps 1 through 5 for all new wires.

7 Repeat the test between all new wires.

8 When all wiring tests are complete, wiring may be potted.

Wiring Internal to the Dispenser

Running Wire to the Electronics Cabinet (without J-Box)

For units without factory-installed J-Boxes, the technician will have to make all wiring connections in the Electronics Cabinet. For units with J-Boxes, connections will be made in the J-Box. Pump field wiring connections are made in the main J-Box. Canadian applications require seals at certain air gap locations. These seals are not required for U.S. applications and most other locations.

Pull the wiring to the Electronics Cabinet for non-factory installed J-Box units. Do not complete field wiring at this time.

To install the wiring internal to the dispenser, proceed as follows:

1. Feed wires through all the contractor-supplied fittings and the 8-inch installed conduit to Electronics Cabinet.
   Note: All fittings must be listed and suitable for use in a Class 1, Division 1 hazardous location. It is recommended that the contractor use a conduit elbow or pull the elbow to connect to the 8-inch conduit to allow easy potting of the conduit. See Figure 7-16 on page 69.

2. Install the fiber potting dam material at the bottom of the 8-inch conduit to a thickness of 3/4 inch. Refer to "Potting Conduits" on page 71. Do not pot at this point in time.
   Note: Use only the fiber potting dam material specified by the potting compound manufacturer, which conforms to the requirements of NFPA 70. Examples of permissible materials are Killark® type "PF" and/or Crouse-Hinds® CHICO X packing fiber. A small screwdriver may be used to press the fiber dam material around and between wires to prevent compound or vapor leak-by. Follow the sealing compound manufacturer's directions for the type of fiber that is to be used.

3. Tighten all conduit unions and fittings.
   Note: Not more than 18 inches of wire should be left above the top of the conduit. All excess wire length must be trimmed and wires routed away from sharp edges.

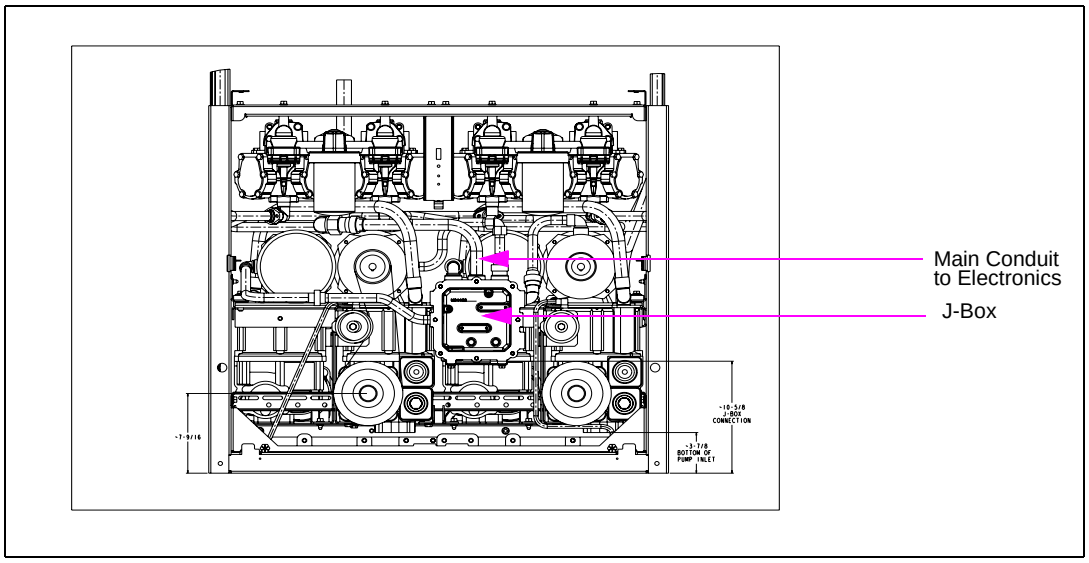
Wiring Pump (Self-contained Unit)

For dispenser wiring, refer to "J-Box and J-Box Conduit Installations" on page 52.

Preparing Field Wiring

Self-contained factory units have the factory-installed J-Box on Side 1 of unit. Field connections are through the 1-inch conduit supplied, which starts on Side 2. See Figure 7-9 on page 63.

Figure 7-9: J-Box Conduit Layout



To prepare for field wiring, proceed as follows:

1. Open the CIM door on Side 1 of the unit. Refer to MDE-3804 Encore and Eclipse Start-up/ Service Manual for instructions.
   Note: Side 1 contains a J-Box.

2. Remove the support brace to gain access to the J-Box cover. Refer to "Wiring Pump (Self-contained Unit)" on page 62. Save the hardware for reinstallation.

3. Remove the box cover and save for reassembly.
   Note: For Encore units that are replacing older units, if the existing wire is too short to reach the installed J-Box and a splice must be made, the contractor must provide and use a Class 1 Division 1 explosion-proof J-Box to make connections according to the code. Refer to "Before Mounting the Unit on the Fuel Island" on page 18.

4. For all units, verify if a Seal-off Y fitting has been installed and sealed as a first connection where the conduit leaves the ground. This fitting must be in place and sealed before proceeding further. Refer to MDE-3802 Encore and Eclipse Site Preparation Manual. Install the adaptive 1-inch metal conduit and union to the J-Box conduit.

5. If the unit requires a call button and conduit, read and understand "Encore Elevation Diagram (Encore 550 with SMART Meter)" on page A-11 before proceeding. If unit contains a lighted canopy, read and understand "Lighted Canopy Conduit and Wiring Options" on page 69 before proceeding.

6. If removed earlier, reinstall the vertical support brace to gain access to the J-Box. The support brace is not optional.

Wiring the Ultra-Hi Dispenser

Depending on the application, Ultra-Hi units require that a specific set of cables be installed. These cables are used to intercept the existing cables and provide connection points from the master and/or satellite units.

Preparing Field Wiring

To prepare for field wiring, proceed as follows:

1 Open the CIM door on Side 1 of the unit. Refer to MDE-3804 Encore and Eclipse Start-up/ Service Manual for instructions.
Note: Side 1 has electronics module access to field connections, boards, and wiring.

2 For units with the J-Box installed, remove the box cover and save for reassembly.
Note: For Encore units that are replacing older units, if the existing wire is too short to reach the installed J-Box and a splice must be made, the contractor must provide and use a Class 1 Division 1 explosion-proof J-Box to make connections according to the code. Refer to "Before Mounting the Unit on the Fuel Island" on page 18.

3 The following table contains information on the cables that are used for specific applications. Refer to "Ultra-Hi Intercept Cables" on page 65. Refer to FE-364 Encore 300 Ultra-Hi Dispenser Field Wiring Diagram for more information on connections.

Description	Part Number	Application	Illustration in Figure
Main AC	M02338	All Ultra-Hi master units	Figure 7-10 on page 65
Valve Intercept	M02372	Master of combo unit - for satellite light only	Figure 7-12 on page 66
Combo Neutral	M02384	Satellite side of combo unit, Satellite	Figure 7-13 on page 66
Transformer Subassembly	M02370	Master of combo unit ~ OR ~ Encore satellite - for satellite light only ~ OR ~ Legacy satellite	Figure 7-11 on page 65
Combo Pump Handle	M02385A001	Encore Satellite, Combo	Figure 7-14 on page 66
Combo 9 VAC	M02386A001	Encore Satellite, Combo	Figure 7-15 on page 66

4 Some cable configurations require that one of the existing connectors be cut off the wires. This allows the wire to be secured to other wires with wire nuts. Refer to the Field Wiring Diagrams and illustrations noted in the table above.

Ultra-Hi Intercept Cables

The following figures (Figure 7-10 through Figure 7-15 on page 66) contain a description, the associated cable block diagram, and the device with which the cable is used.

Figure 7-10: M02338A001 Main AC Cable

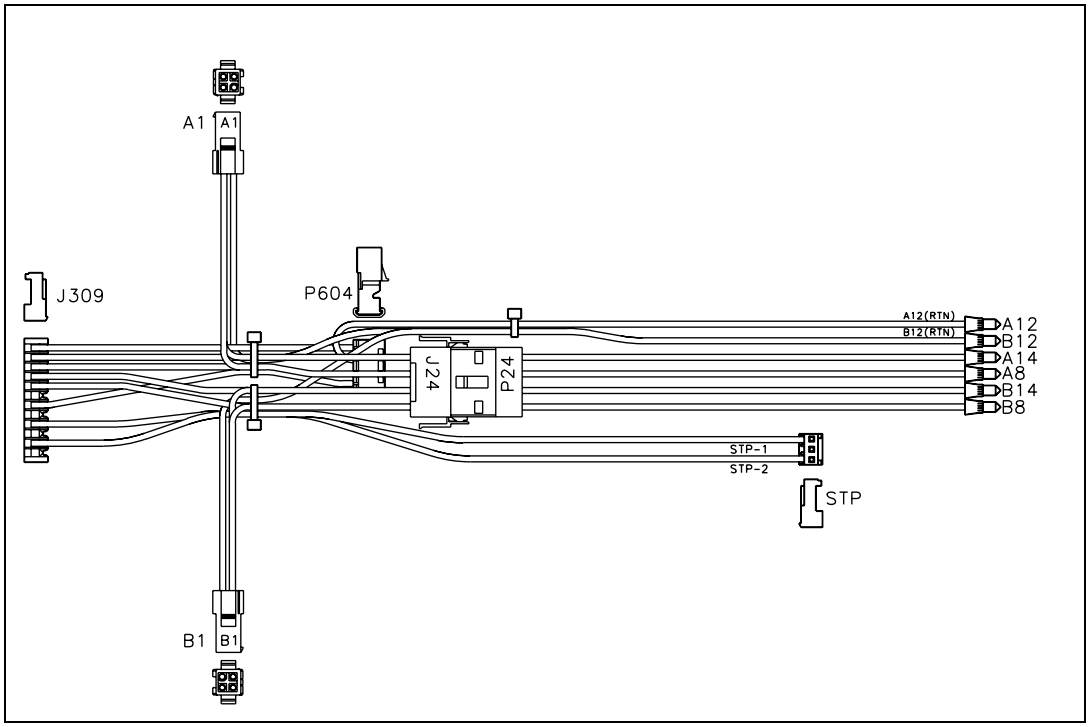


Figure 7-11: M02370A001 Transformer Subassembly

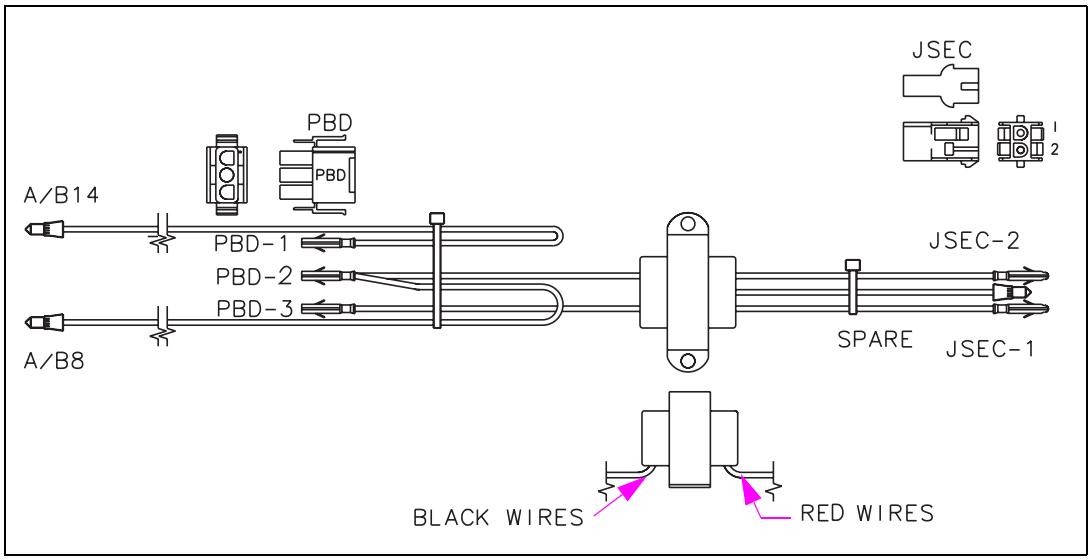


Figure 7-12: M04218A001 Valve Interceptor Cable

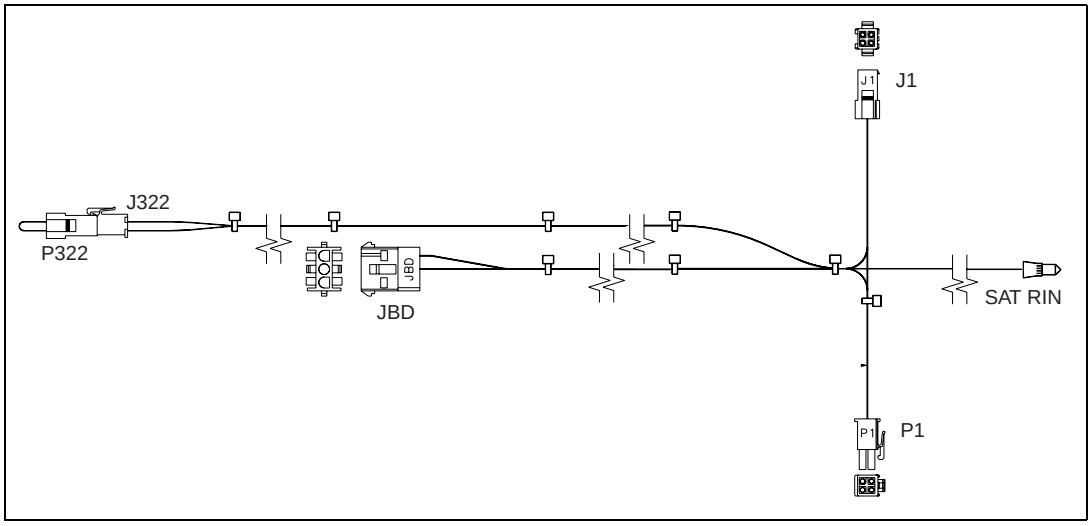


Figure 7-13: M02384A001 Combo Neutral Cable

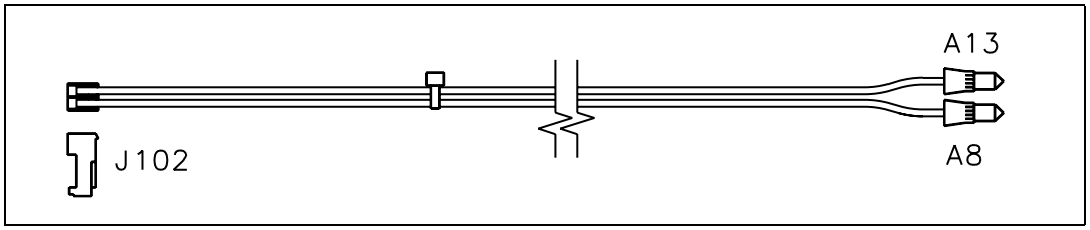


Figure 7-14: M02385A001 Combo Pump Handle Cable

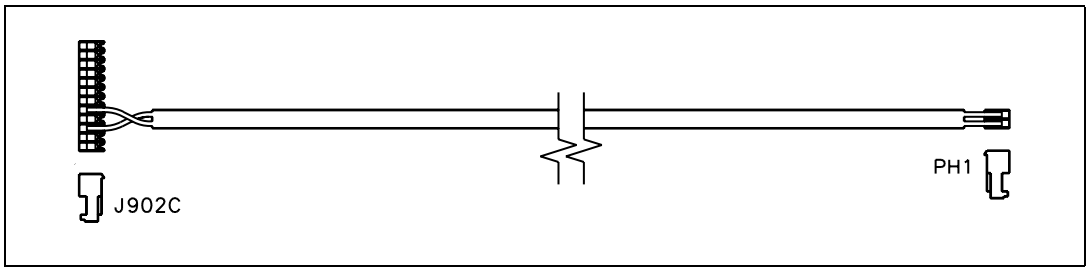


Figure 7-15: M02802A001 Call Interface Power Cable

Completing Field Wiring

In older units with a contractor-supplied box or without a J-Box, the wiring is connected to spring-loaded terminals in the Electronics Cabinet. New units are wired using wire nuts. A small insulated shank screwdriver may be used to open the spring-loaded terminal by pressing down on the spring through the slot provided, but care must be exercised to prevent damage.

To complete the field wiring, proceed as follows:

1. Remove the cover of the J-Box for models so equipped.

2. For units with factory J-Boxes, make the connections in the J-Box. For units with contractor-supplied J-Boxes, connect wiring in both the Electronics Cabinet and J-Box. For units without J-Boxes, make connections in the Electronics Cabinet according to the FE-363 and FE-364 Field Engineering Diagrams. Do not disturb sealing compound around the wires in the existing conduit. Do not disturb the factory wiring in the Electronics Cabinet.

3. For units with J-Boxes, use pipe plugs (refer to FE-363 and FE-364 Field Engineering Diagrams) to seal the unused openings in all J-Boxes. Replace the cover on boxes.

4. Double-check all wiring connections for wire nuts, lugs, caps, and so on. Reinstall the J-Box cover. Ensure that you do not pinch wires and use all the J-Box bolts.

5. Ensure that all conduits entering the Electronics Cabinet are properly potted.

6. On non-SMART Meter applications, reinstall the vertical support brace that was removed to gain access to J-Box.

7. Replace the lower doors and close the doors to the Electronics Cabinet.

Optional Conduits and Wiring

Installing the Call Button/Speaker Conduit

IMPORTANT INFORMATION

- Conduit for call button/speaker wiring must be installed in accordance with all instructions regarding the conduit in MDE-3802 Encore and Eclipse Site Preparation Manual and this manual, as well as, appropriate unit specific addenda. Also consult the equipment manufacturer regarding considerations for equipment tied to the call buttons.
- Call button/Speaker circuits must be Class 2 N.E.C wired. Refer to NEC Article 729-54 and the “Wiring” section in MDE-3802 Encore and Eclipse Site Preparation Manual. All requirements for speaker wiring also apply to call button wiring, and all general procedures and requirements for wiring apply.

For Encore units, conduits may be run into the Electronics Cabinet without the use of a J-Box. Wherever a J-Box is required, (for example, wire connections are required), the contractor must provide an appropriate Class 1 Division 1 explosion-proof junction. Refer to "Connecting to the In-station Diagnostic (ISD) Vapor Flow Meter" on page 72 and mandatory J-Box installation requirements in step 4 of "J-Box and J-Box Conduit Installations" on page 52 for sizing and procedures.

Conduit run for any purpose, including call button, on all units must have a Seal-off 'Y' fitting installed as a first connection where the conduit leaves the ground. Refer to sections "Conduit" and "Sealing Y" fittings in MDE-3802 Encore and Eclipse Site Preparation Manual for mandatory requirements.

⚠ WARNING

Bottom plate of the Electronics Cabinet and the top plate of the Hydraulics Cabinet are separated in accordance with safety requirements.

Loss of integrity at plate penetrations or improper installation of parts can allow fuel vapors to ignite. Resulting fire and/or explosion can lead to serious injury or death.

Running the conduit through the air gap requires strict compliance with procedures outlined in this manual and unit specific addenda. Only listed rigid metal 1-inch conduit may be installed in any unit between Hydraulics and Electronics Cabinets. No unused holes in air gap plates, open spaces between conduit and plates or unsealed conduit penetrations can be present following installation.

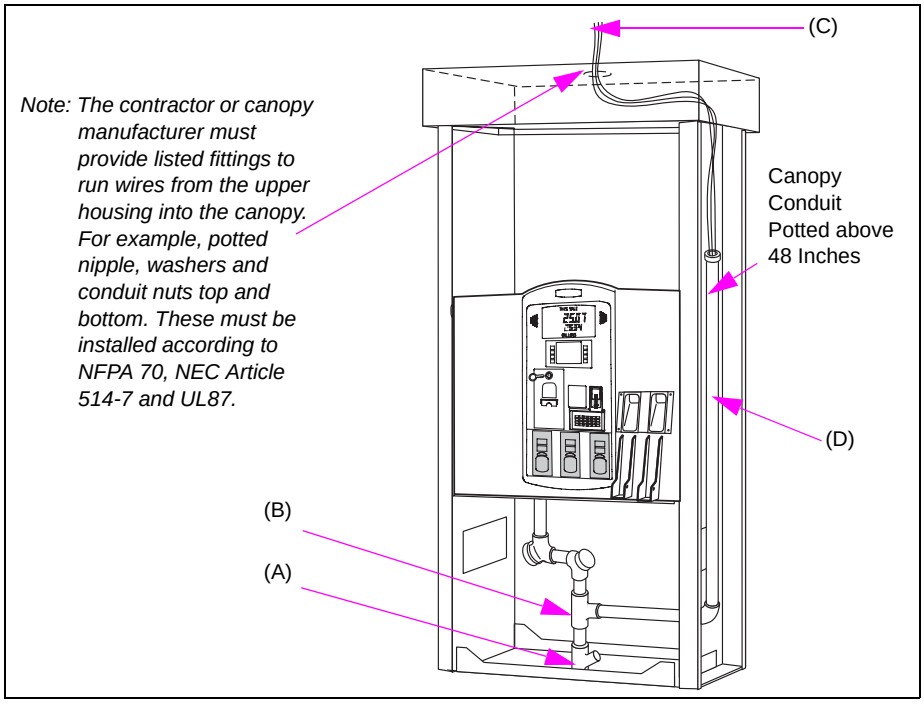
All procedures and requirements in "Completing Field Wiring" on page 67 apply with equal force to call button/speaker conduit installations. This includes the mandatory use of contractor- provided 1 inch by 8 inch conduit stub for any penetration of air gap, and potting of conduit, as detailed in the section. Refer to "Encore Foundation Diagrams: 1 of 7 (Encore 300/500 Dispensers)" on page A-2 showing the location of the penetration point for the call button conduit.

Note: The conduit must be potted irrespective of whether the J-Box is installed or not.

Lighted Canopy Conduit and Wiring Options

Canopy wiring must be installed in accordance with NFPA 70, UL 87 and canopy manufacturer's instructions. Read the entire manual before you begin the conduit installation.

Figure 7-16: Lighted Canopy Conduit and Wiring


Note: The contractor or canopy manufacturer must provide listed fittings to run wires from the upper housing into the canopy. For example, potted nipple, washers and conduit nuts top and bottom. These must be installed according to NFPA 70, NEC Article 514-7 and UL87.
(C)
Canopy Conduit Potted above 48 Inches
(D)
(B)
(A)

To wire the lighted canopy conduit, proceed as follows:

1. Before you proceed, ensure that the Seal-off Y fitting (A) has been installed according to NEC Article 514-7, this manual and fitting manufacturer's instructions. Fitting must be potted to complete the installation.

2. Using only listed rigid conduit and explosion proof fittings, conduit tee (B) or Class 1, Division 1 hazardous location rated J-Box (option not shown; refer to MDE-3802 Encore and Eclipse Site Preparation Manual for references on J-Box sizing) may be installed above the Seal-off fitting.

3. Tee or J-Box allows branch off of power wires for canopy.

4. Canopy vertical conduit (D) is run inside the side column as shown. Conduit **MUST** be potted at a height of 48 inches or higher, with potting material poured to a depth equal to or greater than the trade size of the conduit, and in accordance with NFPA 70 and NEC Article 514-7. See the potting compound manufacturer's instructions for details.

5 A UL-listed metallic conduit capped bushing MUST be slipped over wires and installed at the top of the conduit after potting.

6 Run canopy wires (C) up column and across upper housing to knockout in the center of the top cover, protecting the wiring from sheet metal edges.

7 The Lighted Canopy must be installed onto the unit in accordance with UL and NFPA requirements. This will require, but not be limited, to providing a potted nipple for wires going from upper housing into the canopy, and appropriate listed nuts and washers.

Potting Conduit Stubs

Before potting, ensure that all conduits have been installed, wires pulled, and all wires are tested. All conduits entering the Electronics Cabinet on dispensers or pumps must be potted. Any contractor-supplied conduits entering the Electronics Cabinet must be potted.

Potting up to the Unit

Fill the sealing fitting with potting compound to seal the pathway of the field wiring to the station building. Refer to "Completing Field Wiring" on page 67 or "Potting Conduit Stubs" on page 70.

Potting within the Unit

Potting to the Electronics Cabinet through the Vapor Barrier

In all Encore units, for conduit entry through the Vapor barrier, each of the contractor-provided 8 inch by 1 inch conduits entering and exiting the Electronics Cabinet must be sealed with a sealing compound through the full length of the conduit. This fill-to-length is mandatory according to the UL requirements. Refer to Important Information on page 55.

To pot the conduit, proceed as follows:

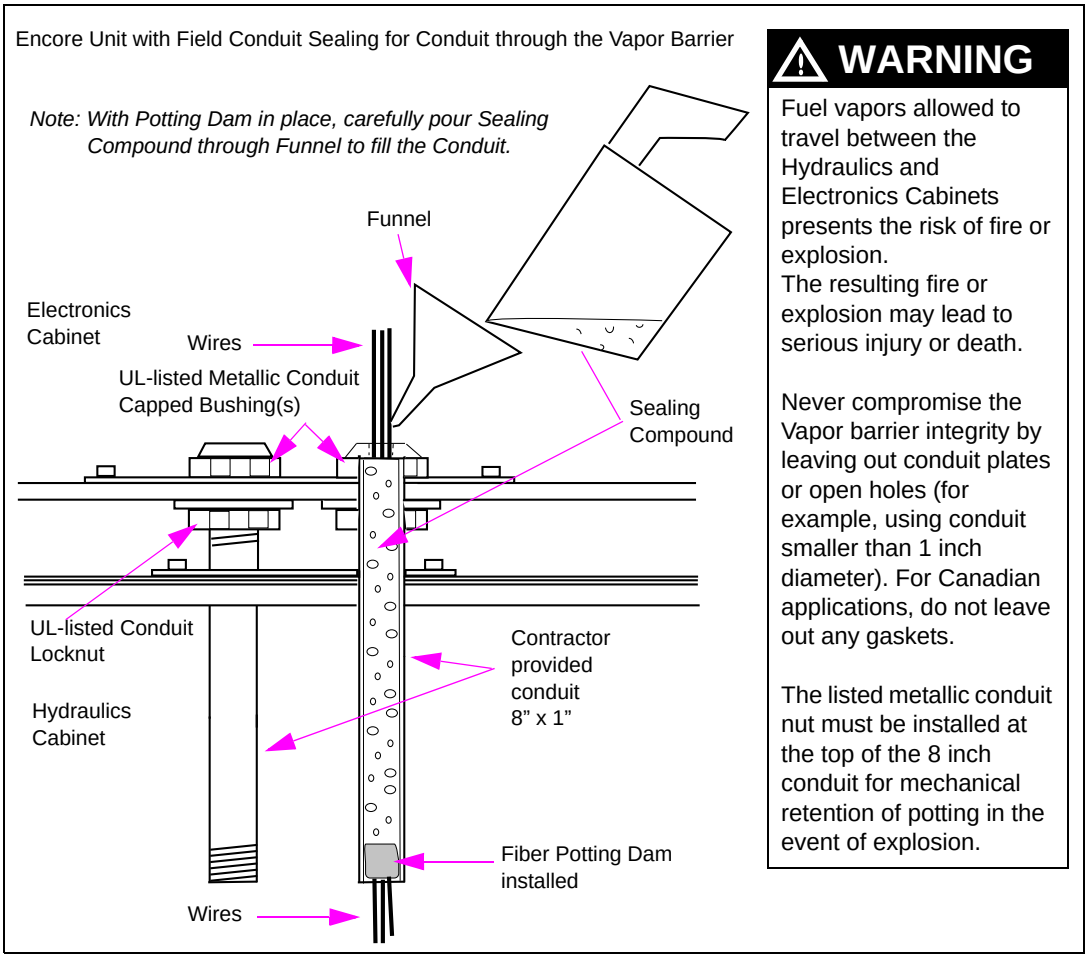
1 Mix the compound in a clean vessel according to compound manufacturer's instructions. Mix only as much potting compound as can be used before the compound hardens.

2 Using a funnel, carefully pour the sealing compound into the conduit from the top until compound is within 1/4 inch from the top of the conduit. See Figure 7-17 on page 71.
Note: Ensure that you pour slowly to prevent air bubbles from forming in the compound and wires around.

3 Immediately clean the spilt compound from conduit threads and cabinet surfaces.

4 Install the UL-listed metallic conduit capped bushing.

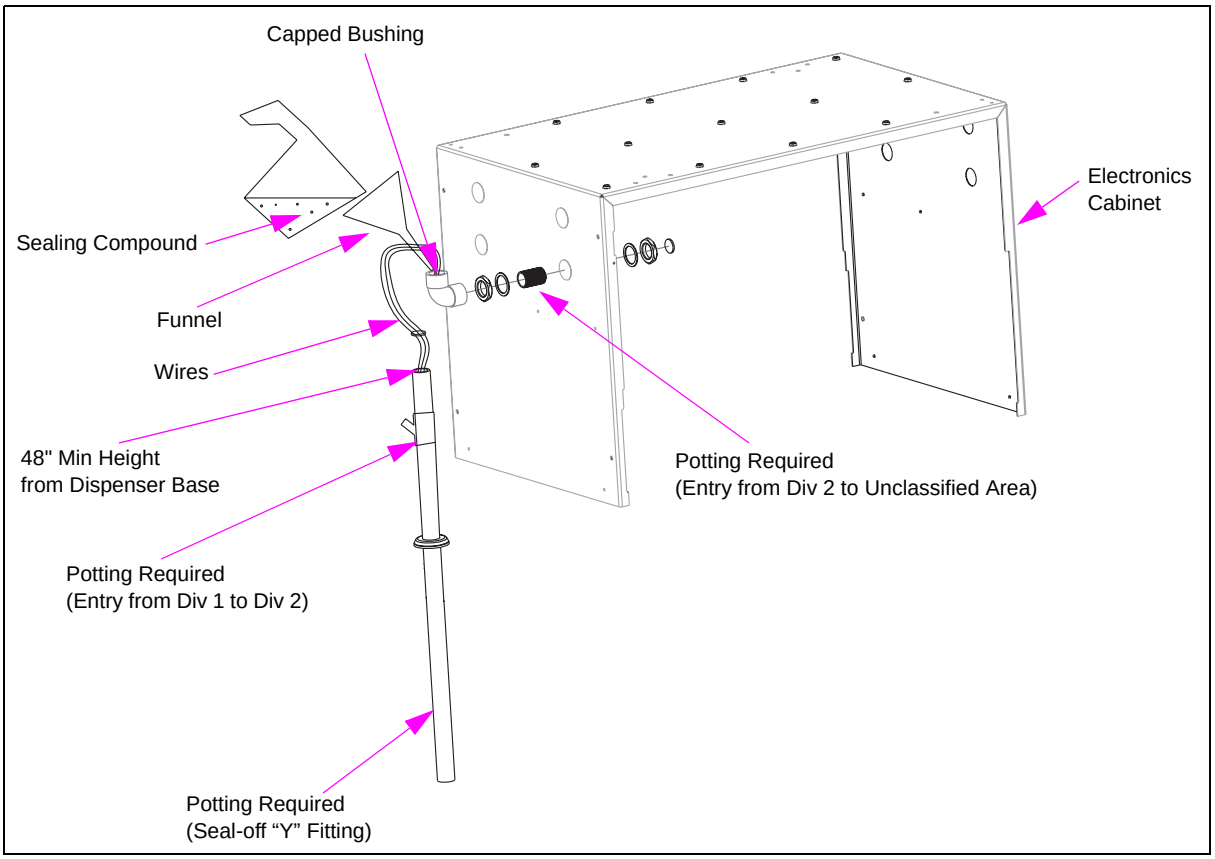
Figure 7-17: Potting Conduits


Encore Unit with Field Conduit Sealing for Conduit through the Vapor Barrier
Note: With Potting Dam in place, carefully pour Sealing Compound through Funnel to fill the Conduit.
Funnel
Electronics Cabinet
Wires
UL-listed Metallic Conduit Capped Bushing(s)
Sealing Compound
UL-listed Conduit Locknut
Hydraulics Cabinet
Contractor provided conduit 8" x 1"
Fiber Potting Dam installed
Wires
WARNING
Fuel vapors allowed to travel between the Hydraulics and Electronics Cabinets presents the risk of fire or explosion.
The resulting fire or explosion may lead to serious injury or death.
Never compromise the Vapor barrier integrity by leaving out conduit plates or open holes (for example, using conduit smaller than 1 inch diameter). For Canadian applications, do not leave out any gaskets.
The listed metallic conduit nut must be installed at the top of the 8 inch conduit for mechanical retention of potting in the event of explosion.

Potting through the Side of the Electronics Cabinet

Rising conduits and side column entry components through the side cabinet must be potted as shown in Figure 7-18 on page 72. The conduit entry must also use seal washers, nuts, and a capped bushing. Kit M07838K001 [including MDE 4701 Side Conduit Entry Hardware Kit (M07838K001) Installation Guide for Encore Units] supplies parts used for such conduit entry plus additional instructions to ensure proper installation. One kit is required per conduit. Knockout in the column is sized for 1-inch conduit. Do not use smaller conduit. Run power and communication wires to the left side of the unit when facing side 1. Run, speaker and other wire conduit to the right side.

Figure 7-18: Conduit Routing through Side Column into Electronics Cabinet


Capped Bushing
Electronics Cabinet
Sealing Compound
Funnel
Wires
48" Min Height from Dispenser Base
Potting Required (Entry from Div 2 to Unclassified Area)
Potting Required (Entry from Div 1 to Div 2)
Potting Required (Seal-off "Y" Fitting)

Notes:1) When pulling wire, allow 8 feet of wiring above ground to make Side Electronics Cabinet Entry wiring connections.

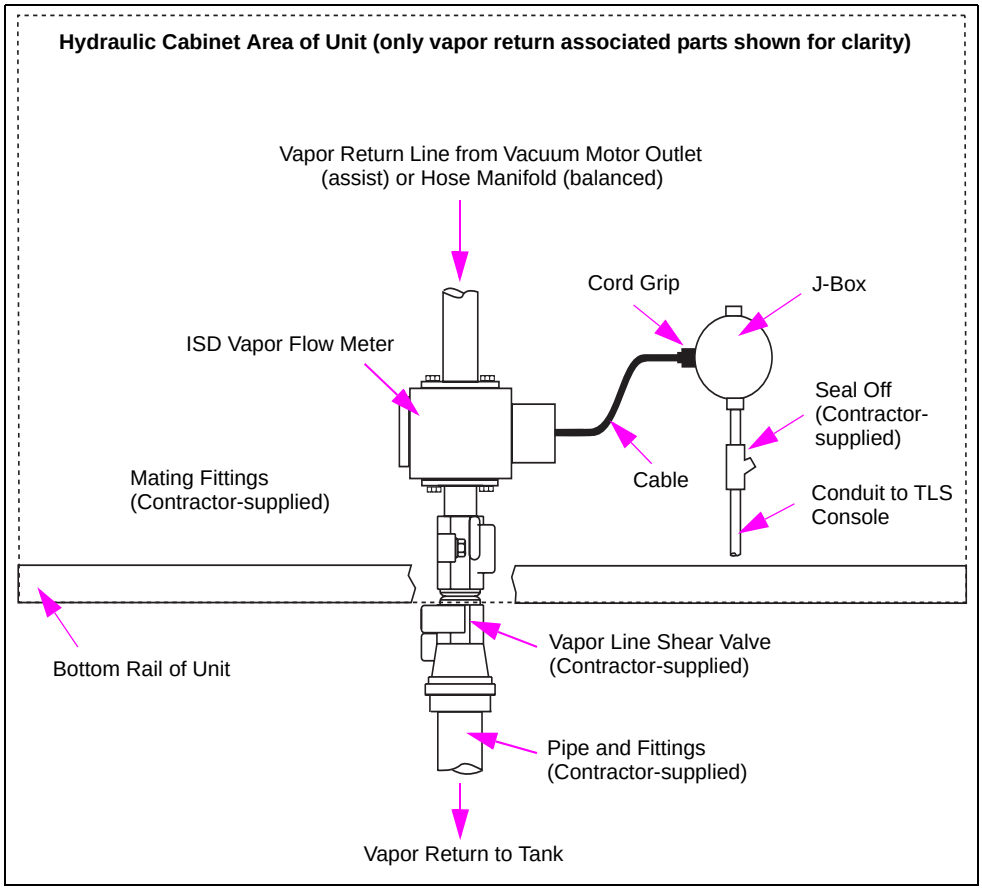
2) A seal-off is required where the conduit exits the ground into the cabinet. A seal off is also required where the conduit enters the side of the Electronics Cabinet.

Connecting to the In-station Diagnostic (ISD) Vapor Flow Meter

At the Dispensing Unit

The Vapor Flow Meter is part of an ISD system that measures the amount of vapor returning to the Underground Storage Tank (UST). Wiring for this device is intrinsically safe and must be run in a separate conduit to the Veeder-Root monitoring equipment or per other allowable Veeder-Root recommendations. The conduit must be potted where it enters and leaves any designated hazardous zones. Potting requirements for hazardous zones must be followed so that fuel vapors do not migrate to other areas. The ISD Vapor Flow Meter wiring terminates at the Tank Level Sensor (TLS) console. The flow meter is in-line and near the vapor return shear valve in the hydraulic area of the unit. Do not create any liquid flow traps. Refer to Figure 6-7 on page 45 for more information on liquid traps.

Figure 7-19: ISD Vapor Flow Meter


Hydraulic Cabinet Area of Unit (only vapor return associated parts shown for clarity)
Vapor Return Line from Vacuum Motor Outlet (assist) or Hose Manifold (balanced)
Cord Grip
J-Box
ISD Vapor Flow Meter
Seal Off (Contractor-supplied)
Mating Fittings (Contractor-supplied)
Cable
Conduit to TLS Console
Bottom Rail of Unit
Vapor Line Shear Valve (Contractor-supplied)
Pipe and Fittings (Contractor-supplied)
Vapor Return to Tank

Epoxy Sealing

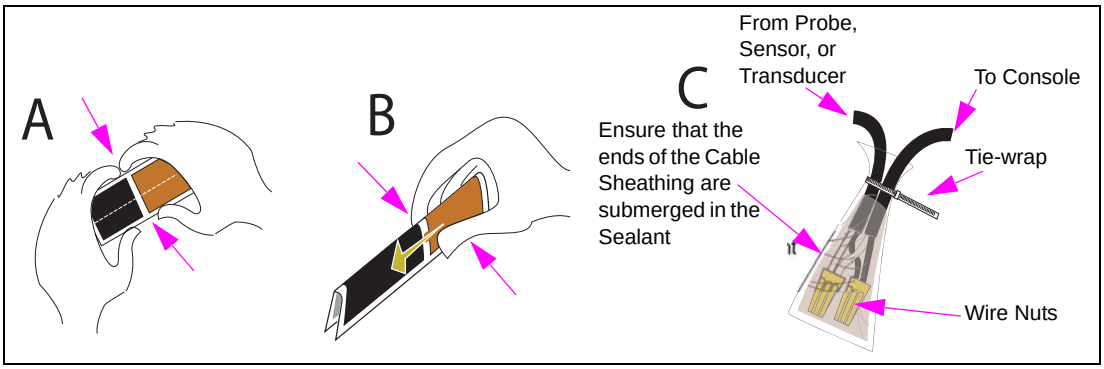
Sealing of wiring connections is necessary to ensure proper performance of intrinsically safe devices where minor corrosion could affect communication to the device.

⚠ CAUTION

Epoxy sealant is irritating to the eyes, respiratory system, and skin. It can cause an allergic skin reaction. It contains epoxy resin and Cycloaliphatic epoxycarboxylate.

Precautions: Wear suitable protective clothing, gloves, eye, and face protection. Use only in well ventilated areas. Wash thoroughly before eating, drinking, or smoking.

Figure 7-20: Epoxy Sealing Field Wiring



Note: When the temperature is below 50° F (10° C), keep the resin in a warm place prior to mixing (for example, in an inside pocket next to the body).

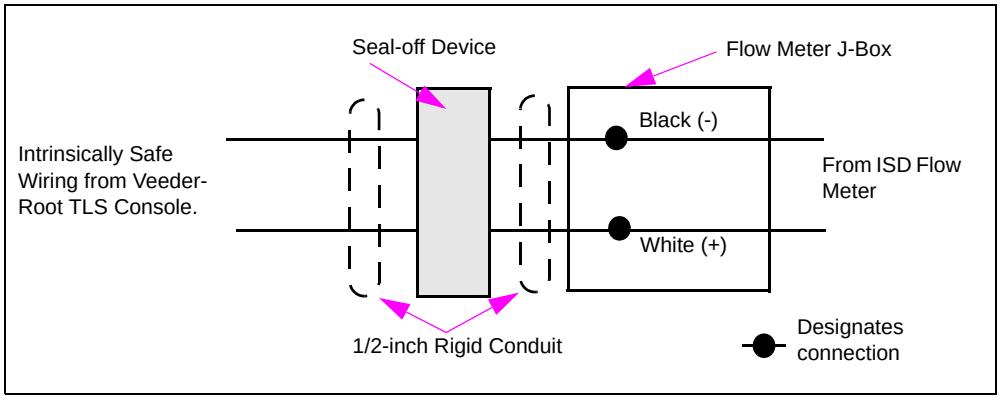
To seal wire nuts with an epoxy sealant, proceed as follows:

1. Open the epoxy sealant package, and remove the resin pack.
2. Hold the resin pack as shown in A (see Figure 7-20), and bend the pack along the length.
3. Firmly squeeze the red side of the resin as shown in B (see Figure 7-20), forcing it through the center seal and into the black side.
4. Mix thoroughly to a uniform color by squeezing the contents back and forth 25-30 times.
5. Squeeze the mixed, warm resin into one end of the bag and cut off the other end.
6. Slowly insert the wiring connections into the sealing pack until they fit snugly against the opposite end as shown in C (see Figure 7-20).
7. Twist the open end of the bag and use the tie-wrap to close it. Position the tie-wrapped end upwards until the resin solidifies.
8. Push the epoxy sealed bag into the J-Box. Replace and tighten the J-Box cover.

To the TLS Console

Wiring from the ISD Flow Meter J-Box terminates at the TLS console. Refer to the In-station Diagnostic Vapor Flow Meter Installation Guide (Veeder-Root document number 577013-796) for additional information. See Figure 7-21 for correct polarity connections.
Note: Correct polarity must be observed when making the connection.

Figure 7-21: Field Wiring ISD Flow Meter Polarity



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8 – Installing Breakaways, Hoses, Swivels and Nozzles

⚠ WARNING

Hold open devices on nozzles that are not of the pressure activated type can allow, for a subsequent customer, flow to occur through the nozzle for an activated fueling position without the subsequent customer manually opening the nozzle.

Spilt or uncontrolled dispensed fuel may result with a potential for fire, explosion, fuel chemical burns or environmental contamination. Serious injury or death may result.

As per Gilbarco and certain standard (NFPA 30A) requirements, pressure activated nozzles must be used for installations that use pump/dispenser or POS activated pre-set operation or alternately where a latch hold open device is used on a non pressure activated nozzle, the latch hold open device must be removed. Consult the nozzle manufacturer for their recommended nozzle model types and safety recommendations.

⚠ WARNING

The hose pulled away from the pump/dispenser could drain fuel or pull the unit over during a drive-off. Explosion and fire or pull off of the dispenser during a drive-off could result in severe injury or death.

Installation of breakaways is required according to NFPA 30A.

⚠ WARNING

Use of hoses other than standard lengths may create a tripping hazard.

Tripping could result in severe injury or death.

Do not use excessively long hoses without a hose retractor.

⚠ WARNING

Flexible fuels such as Biodiesel, high alcohol percentage fuels, and so on may be incompatible with certain plumbing materials and hydraulic components.

Use of incompatible materials or components with alternative fuels can result in leaks or unexpected failures of components resulting in fire or explosion or environmental damage.

When dispensing alternative fuels, verify with the manufacturer of the material or component that all plumbing components are compatible with the fuel being dispensed.

Units without Hose Retractors

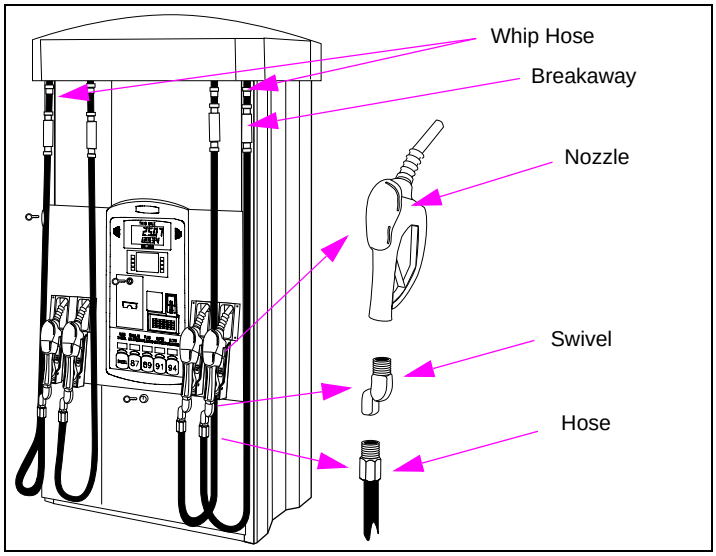
To install breakaways, hoses and swivels in pumps/dispensers without extended reach or hose retractors, proceed as follows:

1 Install the breakaway whip hose to the pump/dispenser outlet casting. See Figure 8-1.

2 Install the listed breakaways to the whip hoses. Follow breakaway manufacturer's instructions.
- Clean all threads.
- Place the sealant on male threads only. Follow the sealant manufacturer's instructions.
  Note: Use only UL-classified pipe sealant approved for use with petroleum products. Remove the sealant if it is found inside the hose or fittings. Clean off the excess sealant. Do not use Teflon tape as it may damage the unit.
- Use a smooth-faced wrench to tighten all fittings securely. Do not overtighten.
  Note: Do not tighten the breakaway by twisting the hose. This could damage the coupling.

3 Install the hose to the breakaway.

Figure 8-1: Hanging Hardware



4 Install the swivel (if used) to the hose. Follow the swivel manufacturer's instructions.

5 Install the nozzle to the swivel or the hose. Follow the nozzle manufacturer's instructions.
Note: Check for the correct nozzle cradle/hook type (vapor, non-vapor, and so on). It must not be possible to activate the nozzle boot switch with the nozzle properly held in place in the nozzle boot.

6 Use an ohm meter to check for continuity from the end of the nozzle to the conductive metal surface in the unit (applies to both types of hoses - retrievers or non-retrievers).

Units With Hose Retrievers or Extended Reach

Note: It is important that Teflon tape not be used on threaded connections, as parts may be damaged during tightening. Use a UL-approved sealant suitable for the fuel involved only where a sealing is required (not used for O-Rings).

⚠ WARNING

Hose fittings and attachments, if improperly grounded, can lead to a spark that may ignite fuel or its vapors.

Explosion or fire could result in severe injury or death.

Check the hoses, breakaways, and fittings for proper conductivity after assembly.

To install breakaways, hoses and swivels in units with hose retrievers/extended reach, proceed as follows:

1. Assemble the hose to the unit's outlet casting. Follow the breakaway manufacturer's instructions.
2. Assemble the breakaway to the hose. Follow the breakaway manufacturer's instructions.
3. Attach the whip hose to the breakaway. Follow the breakaway manufacturer's instructions.
4. Attach the swivel (if used) to the nozzle. Follow the swivel manufacturer's instructions.
5. Assemble and attach the breakaway whip hose to the swivel or nozzle. Follow the hose manufacturer's instructions.
6. Attach the retriever clamp to the long hose positioned to allow maximum extension of the hose, yet not allow a trip hazard.
7. Adjust the tension on the retriever mechanism to ensure that the hose retracts fully. See the kit or manufacturer's instructions for details.

⚠ WARNING

Hose breakaways may not operate properly during a drive-off if the retriever clamp is located between the breakaway and pump dispenser.

The unit may be pulled off an island during a drive-off or fuel may be spilled resulting in a serious injury to death.

Do not install the hose retriever clamp between the nozzle and breakaway for units with hose retrievers.

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9 – Completing the Installation

Do Not Turn on AC Power

⚠ WARNING

Applying power before electrical and mechanical inspections have been completed can be hazardous. Hazardous high voltage, fuel and fuel vapors may be present or the equipment may be damaged.

Serious fires, explosions, electrical shocks, and injuries or deaths could result. Power must not be applied to the unit and associated STPs when installing, servicing or making electrical wiring connections or replacing any electrical components, including light bulbs. Multiple disconnects may be required.

Power should only be applied to the unit after the commissioning Gilbarco ASC checks wiring and so on. The installer must inspect the unit as per "Installation Checklists" on page 82 prior to contacting the commissioning ASC. Incorrect installation could result in an unsafe unit condition. Damage from improper wiring or installation will not be covered by warranty.

When all installation procedures are complete up to this point, the unit must be inspected by a Gilbarco ASC using the following checklists:

- MDE-4227 Encore/Eclipse Start-up Checklist (Form B)
- MDE-4228 Encore/Eclipse Commissioning Checklist (Form C)

Following this, the system must be purged by the installing contractor. Refer to MDE-3804 Encore and Eclipse Service/Start-up Manual for startup instructions. Whether purging is performed now or later, proceed to and complete the section titled "Installation Checklists" on page 82.

Installation Checklists

To ensure proper and safe operation of all equipment and to ensure warranty coverage, installers must inspect the installation and then complete the MDE-4226 Encore/Eclipse Installation Checklist (Form A). The "Mechanical and Hydraulic Related Items" checklist and "Electrical Related Items" on page 83 checklist may be used as a guide (many of the items on the lists should already have been checked by the electrician as covered earlier).

MDE-4226 Encore/Eclipse Installation Checklist (Form A) Name	In Following Checklists, MDE-4226 Checklist Referred To As
Individual Pump/Dispenser Hydraulic/Mechanical Related	List 1
Individual Pump/Dispenser Electrical Related	List 2
Station Electrical	List 3

Follow the checklists and perform all the required inspections. Once the inspection has been completed, insert MDE-4226 (reduce your copy) in the Dispenser Electronics Cabinet away from and not touching any electronic component. The forms should be provided with each unit; if not, contact the Gilbarco Veeder-Root Distributor. It is only necessary to complete the station electrical inspection portions of the form (List 3) in every form, (for every unit at the station).

Note: To preserve the originals for future use, make several copies of all the checklists in this manual.

Mechanical and Hydraulic Related Items

Item	Procedure	See	Checked	MDE-4226 Related Item
1	Shear valves must be installed according to the valve manufacturer's recommendations. Shear point is ±0.75 inch of grade and properly mounted. Vapor line shear valves are required for many localities.	Page 46 of this manual		List 1, Item 1
2	The lower piping brace must be installed according to the installation manual and all product pipes must be properly anchored to it.	Page 38 of this manual		List 1, Item 13
3	Flexible pipes must not be used within the dispenser. However, flexible pipes that meet the local and state codes can be used below the dispenser/pump, when allowed by regulatory authorities.	MDE-3802 Encore and Eclipse Site Preparation Manual		List 1, Item 2
4	Pumps (self-contained units) must have a vacuum actuated pressure regulating valve (Gilbarco Model 52 or equivalent) to prevent positive pressure at the pump base when used with aboveground tanks.	MDE-3802 Encore and Eclipse Site Preparation Manual		List 1, Item 3
5	Hose breakaways must be used and installed according to the manufacturer's recommendations. For units with retrievers, breakaways and whip hoses must be attached to the nozzle end. For units without retrievers, it is attached to the dispenser end.	Manufacturer's specifications		List 1, Item 5
6	All hanging hardware must be checked for continuity.	Page 77 of this manual		List 1, Item 6
7	The unit must be properly anchored to the island.	Page 46 of this manual		List 1, Item 7

Item	Procedure	See	Checked	MDE-4226 Related Item
8	Vapor recovery piping at the dispenser/pump must have no traps or sags. Unit must be mounted using proper quantity, size, and strength mounting hardware.	Page 45 of this manual		List 1, Item 8
9	Verify correct nozzles, piping and brand panels for each grade. Also, verify correct product lines are connected to each pump/dispenser inlet.	unit order specific		List 1, Item 9
10	All code, regulatory agency or customer specified safety warning signs, labels or decals have been installed.	as provided with and for unit		List 1, Item 10
11	Long hose lengths beyond Gilbarco recommendations must not be used without special retrievers. • For VaporVac hoses, no more than 6” of hose length may rest on the ground when the nozzle is resting in the boot. • For Balance Vapor Recovery hoses, no portion of the hose may be on the ground.	NFPA 30A		List 1, Item 11
12	Verify Shear Valve, Nozzle and Dispenser proper shutoff operation	Page 88 of this manual		N/A
13	Units with Ecometers must run with recommended filters	Page 15 of this manual		List 1, Item 15

Electrical Related Items

Item	Procedure	See	Checked	MDE-4226 Related Item
1	Conduit entries into the Electronics Cabinet must be installed according to the installation manual. No unplugged openings must be allowed between the Electronics Cabinet interior and the Vapor barrier or at the side of the Electronics Cabinet. Field conduit into the Electronics Cabinet must be properly potted according to the local, state and national codes as per the installation manual. This is in addition to potting requirements for the conduit below the base of the dispenser/pump.	Page A-11, Page 69 and Page 70 of this manual		List 2, Item 1 List 2, Item 2
2	Field conduit installed in dispenser Hydraulics Cabinet must be securely fastened to the brace supplied with the unit, using appropriately sized U-bolts or pipe clamps.	Page 52 of this manual		List 2, Item 3

Item	Procedure	See	Checked	MDE-4226 Related Item
3	Equipment must be installed in conjunction with an emergency power cutoff to remove all power from the equipment in case of an emergency.	• MDE-3802 Encore and Eclipse Site Preparation Manual • FE-321 Field Wiring STP Control • FE-363 Field Wiring for Encore, • FE-364 Field Wiring Diagram • FE-364 Field Wiring Diagram • FE-363 Field Wiring Diagram • Grounding - Page 99		List 3, Item 2
4	STP isolation relays are required for all dispensers.			List 3, Item 3
5	Use twisted-pair wires as specified for 2-wire communication for new installations or where a new wire is pulled. Do not use shielded wires for video feed, for SMART Connect and Applause Media System. CAT 5E flooded cable is required for SMART Connect and Applause Media System.			List 2, Item 5
6	Use twisted-pair wires for color display communication wiring.			List 2, Item 5
7	All wiring must be of stranded copper of gauge and insulation casing specified.			List 2, Item 6
8	All grounds must be properly connected according to the installation manual requirements as well as the state, local and national codes.			List 2, Item 7
9	Conduit and J-Boxes should be approved for hazardous locations and properly sized for the wiring involved.	• NFPA 30A • NFPA 70 • UL 87 • NEC		List 2, Item 8
10	Properly size all circuit breakers for the units/unit options involved.	NEC and local codes		List 3, Item 5
11	All dispenser/pump wiring should be properly spaced and isolated from wiring for electrically noisy devices such as variable speed STPs, station equipment motors, and other devices.	MDE-3802 Encore and Eclipse Site Preparation Manual		List 3, Item 6
12	All power wiring and circuit breakers to Gilbarco equipment must be dedicated and not be shared with other equipment.			List 3, Item 7
13	All circuit breakers to Gilbarco equipment must be clearly labeled and readily accessible.			List 3, Item 8
14	All distribution boxes must be clearly labeled showing the dispenser/pump number connections.			List 3, Item 9
15	All dispensers/pumps must be wired to the same phase of electrical power.			List 3, Item 10
16	New site wiring must be Megger-tested and wired to the same phase, unless isolation relays are used to protect it against cross phasing. Old site wiring must be continuity and short-tested with a digital meter.	Page 67 of this manual		List 3, Item 11
17	Wiring must be color-coded or tagged, sized for distance and application and resistant to gas and oil.	Page 52 of this manual		N/A
18	J-Boxes must be secured with all bolts and have no unplugged openings.	Page 52 of this manual		List 2, Item 9

Purging Air from System and Testing

For New Dispensers (Purging through a Shear Valve)

Encore dispensers must have some programming changes completed before purging can be started.

Note: Purging of units with Ecometers is similar to C+ meters but more care must be taken. Refer to "Installation Considerations for Units with Ecometers" on page 15 for more information.

Encore 500/500 S

Encore 500/500 S units are received precalibrated but must be checked for calibration prior to use. Purging requires the unit to be configured for gallons, liters or imperial gallons. For quick reference calibration information, refer to MDE-4281 Calibration Quick Reference Card.

IMPORTANT INFORMATION

When purging Encore 500/500 Series units, if you exceed more than 250 volume units for any meter on a side, the startup technician will not be able to reset the volume totals to zero or any other value for opening the station. Avoid purging of more than 200 units of volume per meter as a result. Purging, calibration, and calibration verification can be done within this limit and totals reset if desired.

Encore 300

Encore 300 units are received uncalibrated. Purging requires the unit to be configured for gallons, liters or imperial gallons. When purging, follow the calibration procedure in "Special Steps to Purge Air from Underground Lines" on page 86.

- For full calibration information, refer to MDE-3804 Encore and Eclipse Start-up/Service Manual.
- For quick reference calibration information, refer to MDE-4281 Calibration Quick Reference Card.

Programming Units of Measure

For Encore 300 units, this procedure is referred to as setting the Conversion Factor. For other Encore units, this is referred to as setting Volume Units.

- For full programming information, refer to MDE-3804 Encore and Eclipse Start-up/Service Manual.
- For quick reference programming information for Encore 300 units, refer to MDE-4039 Encore 300 Programming Quick Reference Card.
- For quick reference programming information for Encore 500, 550, and Eclipse units, refer to MDE-3860 Programming Quick Reference Card.

Special Steps to Purge Air from Underground Lines

For sites with underground lines not filled with fuel, air must be purged from the lines before purging the dispenser.

CAUTION

Do not attempt to purge these lines using the dispenser nozzle as the dispenser meters may suffer damage due to overspeed.

Refer to MDE-3804 Encore and Eclipse Start-up/Service Manual procedure to purge air in Encore 300 units.

To prepare for purging, use the following steps for each shear valve in all units. Be observant during purging and check for plumbing leaks as you move toward the tank. For blender nozzles, select a blend grade. Ensure that the prices are set (by ASC) before you begin.

- Turn off all power to the STPs involved.
- Start with the unit farthest from the tank.
- Use a UL-approved sealant to connect a “gasoline suitable, conductive hose” to shear valve test port.
- Install the mechanical valve (petcock) to the hose.
- Place the drain end of the closed valve in an approved metallic container. Clean up any spills promptly.
- Return power to STPs. Activate the STP for the line being purged.
- Slowly open the mechanical valve until you obtain a slow, constant stream of fuel flow. Maintain contact between the metallic valve and the can during fuel flow.
- Turn off STP, bleed pressure using the mechanical valve, remove the valve and hose, and reinstall the pipe plug to the shear valve using UL-approved sealant suitable for the fuel involved.
- Perform all steps in the “For New and Existing Pumps and Dispensers with Fuel in Lines (Purging through Nozzle)” on page 86 section for purging air from the system with fuel in lines.

For New and Existing Pumps and Dispensers with Fuel in Lines (Purging through Nozzle)

CAUTION

Purging air at high flow rates through the meter can permanently damage them. Noise is not an indication of overspeed in many cases.

Overspeed meter damage is not covered by warranty. Follow all instructions carefully.

CAUTION

Meters and other hydraulic devices can be permanently damaged by contamination if units are not equipped with filters during purging and other installation processes.

Non-use of filters during installation is considered abuse. Meters and other components that fail from contamination introduced during installation are not covered by warranty.

Never remove filters during installation. Ecometer and Flexible fuel units require special filters. Do not substitute.

To purge air in new and existing pumps/dispensers where underground product lines are full with fuel, proceed as follows:

1. Lift the nozzle handle for the hose being purged.
   Note: For purging in Encore 300 units, follow the procedure for purging in "For New Dispensers (Purging through a Shear Valve)" on page 85 for the selected meter.

2. Place the nozzle in the approved container.

3. Slowly open the nozzle until you obtain a slow, constant stream of fuel flow.
   Note: For SMART Meter-equipped units, never exceed the nozzle slow latch setting until fuel flow is steady.

4. Purge the system with the amount of fuel specified below:

For	Pump This Amount
Start-ups (installing new systems)	35 gallons (130 liters) per hose
Existing sites where the product lines are full	50 gallons (186 liters) per hose*

** This value depends upon following the procedures in the sequence listed (especially for new sites). Also, a lot could depend upon line lengths, unusual plumbing situations (air traps, and so on); what may be good for most sites may not work for all. Generally, you can observe the effect of air if successive calibration checks read plus. Once they stop reading plus, you have purged all the air.*

5. Return the nozzle to the nozzle boot.

6. Empty the approved container into an appropriate product tank.

7. Repeat steps 1 through 6 for each affected hose and each meter.

Verifying Shear Valve, Nozzle, and Dispenser Shutoff Operation

To verify correct shutoff function of the shear valve, nozzle and dispenser, perform the following after purging air for all nozzles:

1. Close the shear valve.
2. Activate the fueling position associated with the shear valve.
3. Open the nozzle. Fuel should not continue to dribble out of the nozzle for more than a few seconds. If fuel continues to flow for a longer period, check the shear valve or nozzle for problems.
4. Close the nozzle.
5. Open the shear valve.
6. Activate the fueling position for the same fuel on the opposite side of the unit.
7. For side to be tested (opposite activated side), remove nozzle from boot but do not activate boot switch by raising the nozzle boot lever or allowing the auto on flapper to activate.
8. Open the nozzle. Fuel should not continue to dribble out of the nozzle for more than a few seconds. If fuel continues to flow for a longer period, check the nozzle or inform the ASC to check the dispenser valve or valve O-Rings.

Calibration Procedure for Encore 300 Units

All Encore 300 Series meters must be calibrated, prior to there use by customers. For full calibration instructions, refer to MDE-4281 Calibration Quick Reference Card.

Calibration Procedure for Encore 500/500 S Units

IMPORTANT INFORMATION
Units must be properly purged prior to calibration or calibration verification. Incomplete purging of air can result in inaccurate calibration or errors in calibration verification testing (normally, subsequent calibration checks will read plus). Always verify any calibration after setting.

Encore 500/500 S meters are precalibrated, but calibration must be verified. Depending on the type of unit (Encore 500/500 S or Encore 300 Series), the procedure is slightly different. After calibration, the W&M switch must be seal-wired to prevent calibration tampering. Ensure that you draw the seal wire tightly.

Encore 500/500 S (Gallon Unit of Measure)

Temporary pricing should be entered into the unit, as outlined in the section "Installation Checklists" on page 82 to allow dispensing and calibration.

The currently produced Encore 500/500 S units are precalibrated to US gallons and programmed to default programming values.
Note: Perform the calibration verification procedure after calibration.

Programming Instructions - Level 1 Command Codes (Setting PPU)

Level 1 commands are those commands most commonly performed on site by station owner/ operator.

Programming Level Default PIN Code	Command Code	Range
Level 1	2222	20 - 39

- Press **F1** to perform additional programming.
- Press **ENTER** after making selection in all Levels.
- Press **F2** to exit programming.

Note: Entry of level 2, 3, or 4 PIN codes will also allow entry into Level 1 programming.

Command Code 20: Set PPU (Price per Unit) Values
The layout and digit position for this programming feature is shown below.

Figure 9-1: Set PPU Values

$	2	0				Side
V				Grade		Level
PPU			Price	.Price	Price	Unit/ Price

To set the PPU values, proceed as follows:

1. Select Side 1, 2 or 3 (both sides).
2. Select the Grade.
3. Select the Price Level (Cash/Credit).
4. Enter the new PPU.
   Note: Repeat for the other Side, Grade and Price Level.

The units may be operated and purged in normal mode after entering prices. If the unit is in the gallon mode, purging can be done eventually to convert them to metric mode.

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10 – Reference Information

Information contained in this section is provided for the installing contractor's reference. The contractor may or may not be required by individual contract to perform all or any of the requirements outlined. However, all installations must conform to the requirements of this section. The information in this section can be found in detail in MDE-3802 Encore and Eclipse Site Preparation Manual.

Note: The information contained here is not to be used exclusively in lieu of the MDE-3802 Encore and Eclipse Site Preparation Manual, as not all the information contained in the document is found here.

Reference Contents

Section and Information	MDE-3802 Location
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Electrical Requirements	page 94
Emergency Power Cutoff Switch	
Circuit Breakers	page 94
STP Control Relay Boxes for Dispensers	
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Cable Ordering Information	
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Grounding	page 99
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Section and Information		MDE-3802 Location
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	Pipe Installation	
	Pipe Size	
	Pumps (Standard Flow)	
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	Dispensers (Standard Flow)	page 102
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	Dispensers (Ultra-Hi High Gallon)	
	Check Valves	
	Ultra-Hi	
	Shear Valves	

Installation Differences when Replacing the Advantage Series

The following table shows critical differences between the Advantage Series and Encore Series that will affect installation.

Item	Description
Side Identification	In order to emphasize plumbing differences between the Encore Series and the Advantage Series, the nomenclature has been changed. There is no longer a reference to the sides as A and B as with the Advantage Series. The serial plate front of the Encore Series (manufactured on or before December, 2002) is now Side 1 and the back is Side 2. Units manufactured after December, 2002 have the serial plate (label) mounted on the main door behind the CIM door on Side 1. Side 1 is the primary service access side for electronics. **Importantly, Side 1 on an Encore unit replacing an existing Advantage Series unit does not always replace the Advantage Series A Side. In most cases:** • Advantage A Side and Encore Side 1 are reversed for Encore Single-hose and Blender Units. • Advantage A Side and Encore Side 1 are the same for Multi-hose units. Also, the Encore Series uses letters (W, X, Y and Z) to differentiate the product pipes. The Advantage Series units are typically labeled as low and high or A, B, and so on.
Piping Layout	**Do not assume piping connections for the Encore based on the Advantage Series or other unit piping.** **Dispensers**: Encore product plumbing, in some cases, is in the reverse order from the Advantage Series, is spaced differently and has other differences. See one or both of the following: • "Dispenser MPD Piping to Hose Fitting Configurations" on page 25. • "Encore Dispenser Blender Piping to Hose Fitting Layout" on page 32. **Pumps:** Encore product inlet and electrical connection locations on self-contained pumps are different from the Advantage Series (see "Encore Foundation Diagrams: 3 of 7 (Encore 300/500 Pumps)" on page A-4). For pump product inlet to hose configurations, see one or both of the following: • "Pump (MPD) Piping to Hose Fitting Configuration" on page 29. • "Encore Pump Blender Piping to Hose Fitting Configuration" on page 34.

Item	Description
Piping installation	**Dispensers**: The Encore is provided with a lower piping brace. The installer **must** secure plumbing to the lower brace per the installation document else, improper operation of the shear valves may result if a unit is knocked over. Flexible pipe cannot be used within the dispenser, but may be used below the dispenser. Refer to MDE-3802 Encore and Eclipse Site Preparation Manual. The Encore inlet plumbing only extends partially into the Hydraulics Cabinet. This allows much greater installation adaptability by using rigid piping when retrofitting to competitive equipment pit boxes and plumbing layouts. In addition to side-to-side inlet adjustment capability, the lower piping brace can be mounted forward or rearward for additional adaptation. **Pumps**: Pumping units in self-contained pumps are shipped without inlet fittings. At installation, the protective closure in the pumping unit inlet must be removed and replaced with the proper inlet fittings. Refer to MDE-3802 Encore and Eclipse Site Preparation Manual.
Frame width	There is only one frame width for the Encore Series. The Advantage Series units come in wide and narrow frame types. The Encore Series width is intermediate between the wide and narrow frame width of the Advantage Series. However, it is recommended to use a pit box designed or adaptor for the Encore for new stations or major renovations. See one of the following: • "Encore Foundation Diagrams: 1 of 7 (Encore 300/500 Dispensers)" on page A-2. • "Encore Foundation Diagrams: 3 of 7 (Encore 300/500 Pumps)" on page A-4. Also, refer to MDE-4166 The Advantage Series Unit to Encore Island Adaptor Kit M03064K001 Installation Manual.
J-Box	**Dispensers:** The Encore Series units may ship with or without a J-Box or field conduit. Conduit and J-Box not part of order is provided by installer. This allows more versatility for electrical conduit routing. As the installer may install the J-Box towards the front or rear of the unit, it is not recommended to use the location of the J-Box openings as an indication of front or rear of the unit. Always use the serial plate to identify Side 1. **Pumps:** The Encore Series Pumps have a factory installed J-Box, located on Side 1, but the electrical power connection is a 1-inch NPT conduit inlet located on Side 2. All electrical power wiring to the unit must enter the conduit on Side 2 and feed to the J-Box. Ethernet and intercom connections are to enter the unit on Side 2. See "Encore Foundation Diagrams: 3 of 7 (Encore 300/500 Pumps)" on page A-4. • J-Boxes, conduit and fittings must conform to all requirements listed and referenced in this manual. • For new installations, with proper pull of additional wire, it is possible for Encore to eliminate a J-Box. The Advantage Series units always have a J-Box.
Electronics Cabinet	The Encore Series Electronics Cabinet has two field conduit inlets. Facing Side 1, the ones to the center left are for power wiring while the ones to the center right are for intercom/Ethernet/call button/ speaker wiring. In the Advantage Series, the power goes into the J-Box and intercoms, and so on, usually in a special conduit up a side column. Ethernet will be an option on future Encore units with installation of an optional board in the Electronics Cabinet. All Encore units have knockouts for Ethernet wiring although the option board is not currently available. Ethernet wiring can share the conduit with a speaker/intercom/call button.
Wiring in Electronics Cabinet	The Encore Series units use wiring terminal blocks, as appropriate, for field wiring where the Advantage Series uses wire nut connections.
Mandatory conduit potting requirements	The installer must pot each conduit entering the Electronics Cabinet in two locations as specified in this manual. One is at entry into the Electronics Cabinet and the other is in the pit box. The Advantage Series units only require potting below the unit.
Calibration	All Encore meters are electronically calibrated. Advantage meters are mechanically calibrated. Refer to MDE-3804 Encore and Eclipse Start-up/Service Manual.

Electrical Requirements

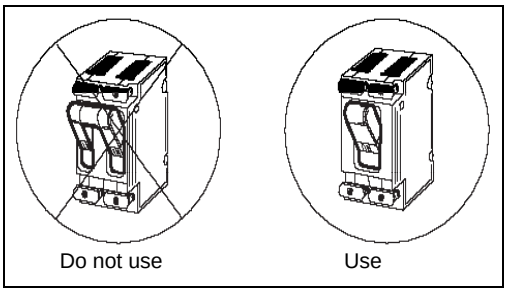
- Sites must be prepared according to NFPA 30A, NFPA 70, and applicable national, state and local codes/regulations.
- All circuit breaker panels and relay boxes must be mounted securely to the wall.
- Only UL-recognized/approved components and/or systems may be used.
- Licensed electricians experienced with pump and dispenser installations must be used to make all electrical connections.
- Installation requires a dedicated circuit phase system. All electronic units must be wired to the same power leg.
- An earth ground is required for all circuits.

Emergency Power Cutoff Switch

- NFPA 30A and Gilbarco require installation of one or more emergency power cutoff switches.
- An emergency power cutoff switch is a single control that removes AC power to all island equipment (pumps/dispensers, STPs, canopies, lights, and so on). See Figure 10-1.
- The emergency power cutoff switch must be accessible, labeled clearly and installed away from any hazard that may occur at the pumps/dispensers. Cutoff switches must not be located more than 100 feet away from the pumps/dispensers.

Circuit Breakers

Figure 10-1: Switched Neutral Circuit Breaker



- A dedicated UL/CUL/CSA-listed switched neutral breaker is required for each circuit leading to a pump/dispenser or dispenser and STPs. It must be able to disconnect hot and neutral conductors simultaneously. Single-pole breakers with handle ties cannot be used.
- Only UL/CUL/CSA-listed circuit breaker panels are permitted for use.
- Circuit breakers must be installed away from the pumps/dispensers, readily accessible and clearly marked.
- A separate circuit breaker is required for each STP (dispenser models) or each pump motor (self-contained models).
- One circuit breaker is required for each pump/dispenser to allow isolation of pump/dispenser.

STP Control Relay Boxes for Dispensers

- Gilbarco requires installation of STP isolation relays in addition to STP control relays. Combined STP Control Relay/Isolation Relay boxes are recommended.
- Each STP requires a separate control relay for each STP.
- Dispenser relay must not be used to power the STP.

STP Isolation Relays for Electronic Dispensers

STP isolation relays provide electrical isolation between dispensers and prevents damage from cross phasing. Refer to MDE-2755 STP Control and Dispenser Isolation Relay Box (PA0287) and FE-321 Gilbarco STP Isolation Relay Box PA0287 120 VAC Field Wiring Diagram.

Note: For 3-phase STP, use isolation relay at the input of the 3-phase STP control box.

- Gilbarco requires installation of STP isolation relays in addition to STP control relays. Combined STP Control Relay/Isolation Relay boxes are recommended.
- Isolation relays must be installed for each STP control line at each dispenser or dispenser grouping on a single circuit breaker.
- Neutral wire must be routed to the control relays from the dispenser circuit breaker (see field wiring diagrams).

Conduit

Gilbarco recommends that spare conduits be run for future high speed communications. Refer to "Twisted-pair Conduit" on page 96 for details.

- Use a minimum of 1-inch conduit for all Encore and Eclipse pumps/dispensers except for Encore Ultra-Hi, where you need to use 3/4-inch conduit to connect wires to the pump/dispenser. Infoscreen and two-wire data wires can share this conduit (see model-specific wiring diagrams).
- Use separate 1-inch conduit for e-CRIND® or intercom wiring. This is required for higher data rate TCP/IP communication.
- Run all power and light wires in threaded, rigid metal conduit or in a rigid non-metallic conduit. The conduit must conform to national and local electrical codes. If non-metallic conduit is used, it must be at least two feet underground. The last two feet of the underground run to the J-Box must be rigid metal conduit or threaded steel intermediate metal conduit.
- Never share conduit or wire troughs with other manufacturer's equipment (that is, speaker wires, and so on).
  Note: The same conduit may be used for routing power to the pump/dispenser and the two-wire data loop (Class 1 circuit). The two-wire data loop is a Class 1 circuit.
- Metal conduit is not sufficient to provide an equipment ground. A separate ground wire must be used.
- Knock-out boxes or flexible conduit are not permitted for installation.
  Note: Extra J-Boxes added to the pump/dispenser must be listed Class 1, Div. 1, Group C and D explosion-proof.
- All electrical fittings must be listed for Class 1, Group C and D hazardous locations as required by NFPA 30A and NFPA 70.
- A Seal-off 'Y' fitting (for example, Killark Type EY) must be installed on all units as a first connection where the conduit leaves the ground.

Wiring

For high speed communications information, refer to "Twisted-pair Conduit" on page 96.

- All pumps/dispensers must be wired according to NFPA 30A, NFPA 70 and applicable national, state, and local codes/ regulations.
- All circuits must be Class 1 N.E.C wired except the speaker (intercom) circuit which must be Class 2 N.E.C. The speaker (intercom) circuit requires a separate 1-inch conduit.
- Only stranded gas and oil resistant copper wire rated for 300 Volts (up to 240 VAC source) and 80° C may be used.

- In the main conduit, for communications, only twisted-pair, two wire data pairs may be used.
- All dispensers must be wired on the same phase.
  Note: If the Gilbarco isolation relay box is installed, dispensers are not required to be on the same phase.
- Only listed wire nuts may be used for connections. Tape is not permitted.
- Seal-off Y fitting(s) must be potted after all wires are run and tested to termination points.

Twisted Pair Wiring - Data Wire Lengths

Refer to the table below to determine maximum data wire lengths.

For this Distribution Box	The Distance Between the Distribution Box and Dispenser	The Distance Between the Distribution Box and Console/Controller
PA0133, PA0187 G-SITE®	"Total" data wire system run no more than 2600 ft. with 14 AWG.	
PA0242 Transac® System 1000	No more than 2600 ft. with 14 AWG.	No more than 2600 ft. with 14 AWG.
PA0261 Universal D-Box	No more than 2600 ft. with 14 AWG.	No more than 2600 ft. with 14 AWG.
PA0306 Distribution Box	No more than 2600 ft. with 14 AWG.	No more than 2600 ft. with 14 AWG.

Note: When installing new 2-wire communication wiring, use unshielded twisted-pair data wires. Do not use shielded wires. Wiring spec: 2-wire twisted-pair (UTP) with 10 to 12 twists per foot, stranded annealed copper tinned with 18 AWG minimum required for runs up to 1000 feet or 14 AWG minimum for runs up to 2600 feet. Do not use daisy chain communications wiring. Insulation spec: Polyvinyl chloride (PVC) insulation of type TFFN or MTW, UL-approved gasoline and oil resistant. Refer C&M Corporation Part #27525 (18 AWG) or equivalent. Gilbarco part number for the wire is: Q13221-02.

Twisted-pair Conduit

Gilbarco recommends the use of 1-inch rigid conduit and fittings (refer to "Conduit" on page 95) for twisted-pair cable(s). This will allow up to two speakers and two call/stop buttons per side, plus Ethernet.

Note: Terminate the conduit in the dispenser containment pan consistent with all national and local electrical codes.

Twisted-pair Cable

Gilbarco specified cable must be used to permit issuance of a Certificate of Conformance and/or warranty. Use of cables of other types may also create a hazardous situation.

⚠ WARNING

Petroleum vapors may migrate inside the cable insulation between conductors and sheathing of various cables, including Twisted-pair cables. Vapors may ignite, leading to serious injury or death.

Use only twisted-pair cables specified by Gilbarco.

Ethernet Cable

Gilbarco requires use of only 10 Base-T cable as specified in this document.

⚠ WARNING

Petroleum vapors may migrate inside the cable insulation between conductors and sheathing of various cables, including 10 Base-T cable. Vapors may ignite, leading to serious injury or death.

Use only 10 Base-T cable that is specified by Gilbarco and has these properties:

Safety Certification: UL Listing AWM Style 21094 80° C 300 Volts.
Vapor Test: Compliant to UL Standard 87, Section 36A, Para. 22.17

Cable Ordering Information

Type	Comments
Q13221-02	Wire - 600 Volt Stranded, Annealed Copper Tinned with PVC Insulation
Type TFFN or NTW	UL-approved Gasoline and Oil-resistant
18 AWG	Wire with 10-12 twists per foot

Ethernet Cable Installation Personnel and Procedures

IMPORTANT INFORMATION

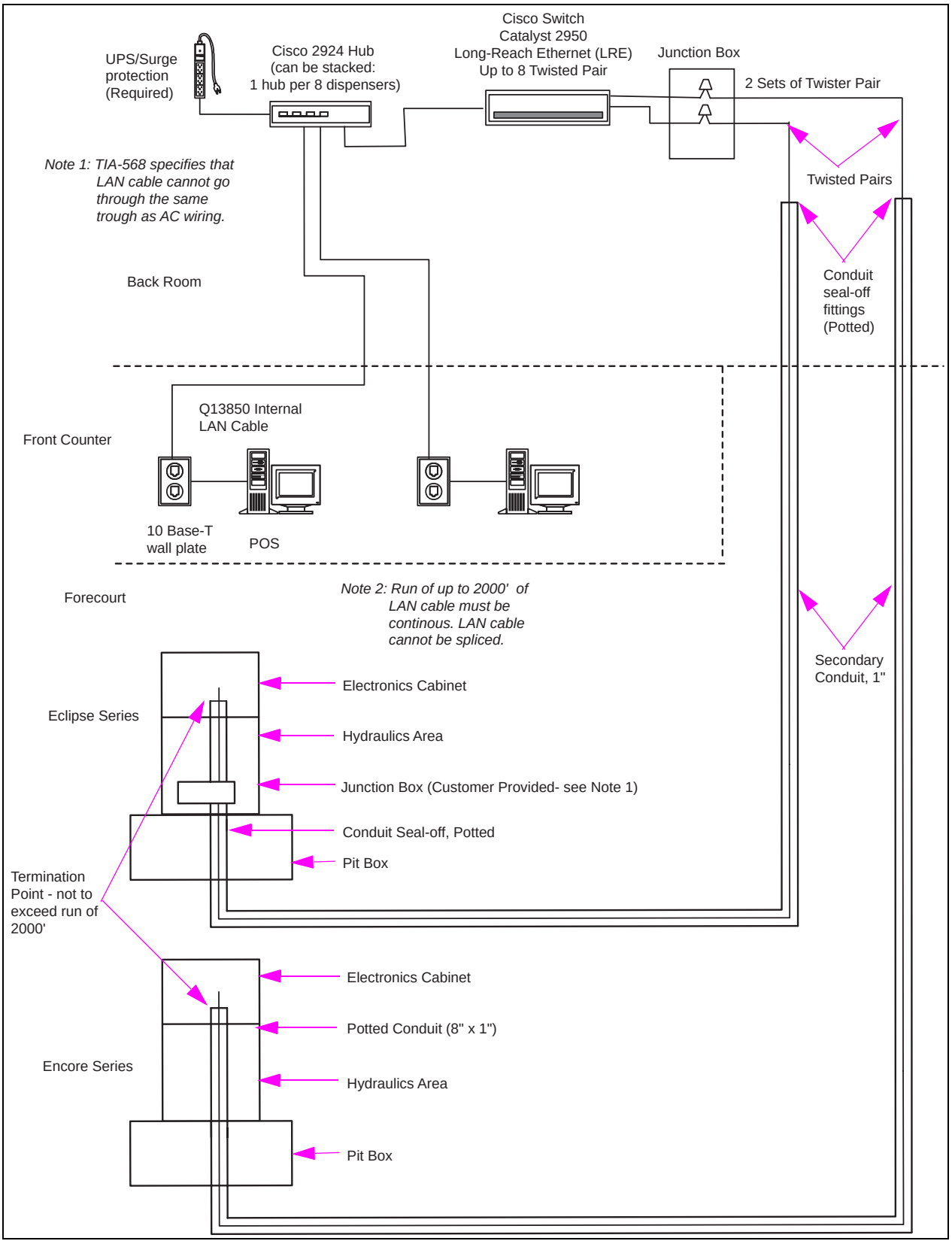
A copy of the ANSI/TIA/EIA TSB 67 certification of conformance from the wiring personnel must be provided to the ASC before the site can be commissioned. The certificate is part of the documentation that must be on file at the installation site. A certification of the field test will be required at equipment start-up. Contact Gilbarco with any questions regarding this procedure.

Ethernet Cables must be installed by certified telecommunications technicians in accordance with ANSI/TIA/EIA 568-A Commercial Building Telecommunication Cabling Standards (and Amendments). The installing technician must read and understand the following:

Document	Title
ANSI/IEEE 142-1991	Recommended Practice for Grounding of Industrial and Commercial Power Systems (IEEE Green Book)
ANSI/IEEE 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment (IEEE Emerald Book)
ANSI/TIA/EIATSB67	Transmission Performance Specification for Field Testing of Unshielded Twisted-pair Cabling Systems
ANSI/TIA/EIA568-A	Commercial Building Telecommunication Cabling Standards (with amendments)

Ethernet Cable - High Speed Communications Wiring

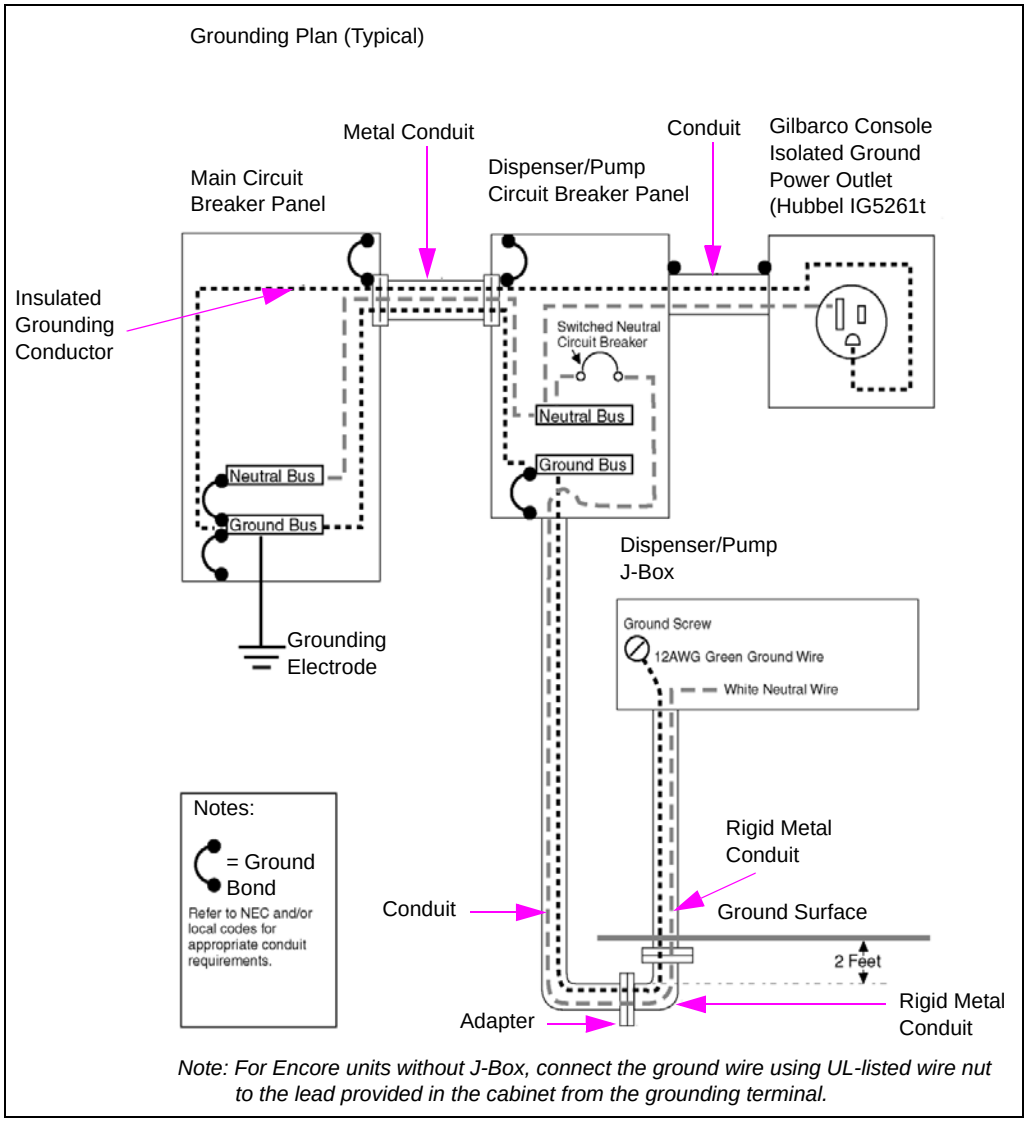
Figure 10-2: Encore and Eclipse High Speed Communications Wiring (Typical)


UPS/Surge protection (Required)
Cisco 2924 Hub (can be stacked: 1 hub per 8 dispensers)
Cisco Switch Catalyst 2950 Long-Reach Ethernet (LRE) Up to 8 Twisted Pair
Junction Box
2 Sets of Twister Pair
Twisted Pairs
Conduit seal-off fittings (Potted)
Note 1: TIA-568 specifies that LAN cable cannot go through the same trough as AC wiring.
Back Room
Front Counter
Q13850 Internal LAN Cable
10 Base-T wall plate
POS
Forecourt
Note 2: Run of up to 2000' of LAN cable must be continous. LAN cable cannot be spliced.
Secondary Conduit, 1"
Eclipse Series
Electronics Cabinet
Hydraulics Area
Junction Box (Customer Provided- see Note 1)
Conduit Seal-off, Potted
Pit Box
Termination Point - not to exceed run of 2000'
Electronics Cabinet
Potted Conduit (8" x 1")
Encore Series
Hydraulics Area
Pit Box

Grounding

- NFPA 70 requires connecting the following to the system ground:
  - Consoles
  - Pumps and dispensers
  - Submerged turbine pumps
  - Relay control boxes
  - Circuit breaker panel
  - Electronic leak detectors
- Gilbarco requires connecting each pump/dispenser to an equipment grounding conductor (Figure 10-3) located in the conduit per NFPA 70, Article 250. The following applies to ground conductor:
  - Use of wire no smaller than 12 AWG.
  - Use of wire with green or green and yellow striped insulation.
  - Connection to green grounding screw in the J-Box.
  - Grounding the providing power under NFPA 70, Article 250.
  - Bonding the neutral bus to an approved grounding electrode.

Figure 10-3: Grounding Plan



Note: For Encore units without J-Box, connect the ground wire using UL-listed wire nut to the lead provided in the cabinet from the grounding terminal.

Sealing 'Y' Fittings

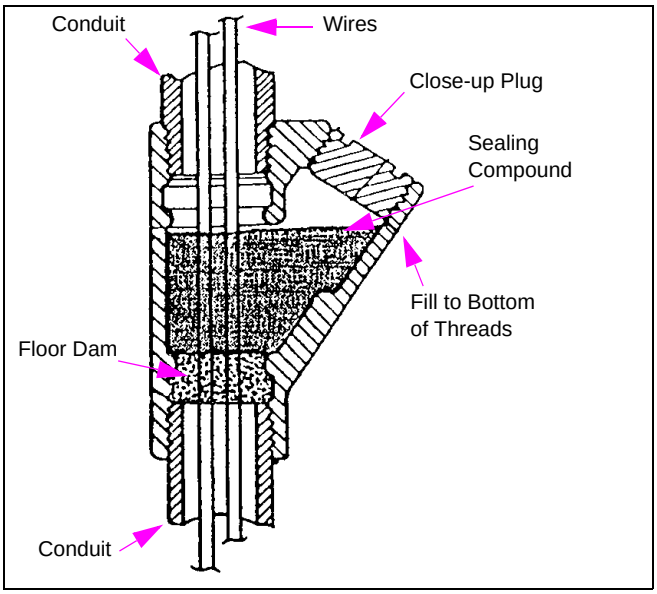
'Y' seals are installed in the conduit runs to minimize passage of vapors, gases or flames from one portion of the electrical installation to another through the conduit. Fittings must be installed in accordance with Articles 501-5 and 502-5 of the National Electric Code and fitting manufacturer's instructions.

Gilbarco uses Killark Type EY fittings and recommends them or their equivalent for vertical conduit runs. The following sealing directions are for Killark fittings only, and instructions may vary for other manufacturer's fittings. Read and understand all instructions completely before you begin.

To seal 'Y' fittings, proceed as follows:

1 Remove the close-up plug (see Figure 10-4).

Figure 10-4: Typical 'Y' Sealing



2 Separate conductors and fill the conduit in and around conductors using Killark type "PF" packing fiber to make a floor dam to hold the fluid sealing compound.

Note: Floor dam must be even with the conduit stop in the lower hub of the fitting. Use care so as not to damage the conductor insulation. Force packing between conductors and hubs, pushing any shreds of packing fiber away from conductors to prevent leakage path.

3 Use only Killark Type "SC" sealing compound with Killark fittings, and do the following:

- Use a clean mixing vessel for every batch of sealant.
- Mix the compound at the rate of 3 parts compound to 1 part water by volume.
- Sprinkle the compound in water while stirring, until a thick paste is formed.
- Do not mix more compound than can be used in 15 minutes.
- Continue mixing for at least 3 minutes, until consistency is just fluid enough to pour slowly, like thick gravy (not watery).

4 Slowly pour the fluid compound till it fills to the bottom of the Close-up plug threads.
Note: Be careful to pour slowly, to avoid trapping air bubbles in the seal.

5 Immediately wipe off any spilled compound and close the seal with close-up plug.
Note: Initial setting of the sealing compound will occur within 30 minutes. Compound requires a minimum of 8 hours above 32° F to develop sufficient strength to withstand explosion pressures.

Plumbing Requirements

Pipe Installation

Refer to PEI Publication RP100 Recommended Practices For Installation Of Underground Liquid Storage Systems (Chapter 9) and PEI Publication RP200 Recommended Practices For Installation Of Aboveground Storage Systems For Motor Vehicle Fueling. Product inlet pipes and vapor pipes for Gilbarco pumps/dispensers vary in location between models. See model-specific footprint.

- Check national, state and local regulations for installation of pipe system.
- Use containment system as required by national, state and local regulations.
- Use new black iron pipe constructed of UL-approved pipe material and UL-approved fittings.
- Use 1-1/2 inch pipe for riser-to-pump or dispenser.
- Use 2-inch risers on Ultra-Hi units which use a 2-inch shear valve.

IMPORTANT INFORMATION

Piping for alternative fuels requires special plumbing material in many cases. Verify with the plumbing supplier that the piping components/materials are compatible with the fuels being used.

Pipe Size

The required pipe size depends on the number of units sharing lines, size of the STPs (dispensers only), and length of the run. Use the following guidelines.

Pumps (Standard Flow)

Use new 2-inch, 2-1/2 inch or 3-inch pipe. Use a 2-inch pipe for runs up to 50 feet to a single pump. Increase to 2-1/2 inch or 3-inch pipe for longer runs up to 75 feet to a single pump with maximum lift condition. A dedicated line is recommended to supply each self-contained pump.

Pumps (High Flow)

Use new 3-inch, 3-1/2 inch, or 4-inch pipe. Use 3-inch pipe for runs up to 50 feet to a single pump. Increase to 3-1/2 inch or 4-inch pipe for longer runs up to 75 feet to a single pump with maximum lift condition. A dedicated line is recommended to supply each self-contained pump.

Dispensers (Standard Flow)

Use new 2-inch or 2-1/2 inch or 3-inch pipe. If distance from STP to farthest dispenser is 200 feet or less, use 2-inch pipe. If distance exceeds 200 feet, use 2-1/2 inch or 3-inch pipe to the first dispenser and 2-inch pipe the rest of the way.

Dispensers (High Flow)

Use new 3-inch or 3-1/2 inch or 4-inch pipe. If distance from STP to farthest dispenser is 200 feet or less, use 3-inch pipe. If distance exceeds 200 feet, use 3-1/2 inch or 4-inch pipe to the first dispenser and 3-inch pipe the rest of the way.

Dispensers (Ultra-Hi High Gallon)

Use new 3-inch or 4-inch pipe. If distance from STP to farthest dispenser is 75 feet or less, use 3-inch pipe. If distance exceeds 75 feet, use 4-inch pipe to the first dispenser and 3-inch pipe the rest of the way.

Check Valves

(Pumps)

See PEI publication RP100 and manufacturer's installation instructions for information on installing the check valve. Install the check valve as close as practical to the suction unit. It should be gravity activated with minimal, or no spring load. Check valves for use internal to the pumping unit are available from Gilbarco as an order entry item.

Ensure that there is only one check valve in each dedicated line. Use of multiple check valves can restrict flow and cause cavitation resulting in significant flow rate reductions. If multiple units are to be used on a single line, check valves are required at each pumping unit.

Ultra-Hi

Most Gilbarco units are equipped with check valves prior to the meter. For the Ultra-Hi unit, the Check Valve is optional but highly recommended to avoid calibration issues and those associated with sale indication when the nozzle is off and the unit is first authorized.

Shear Valves

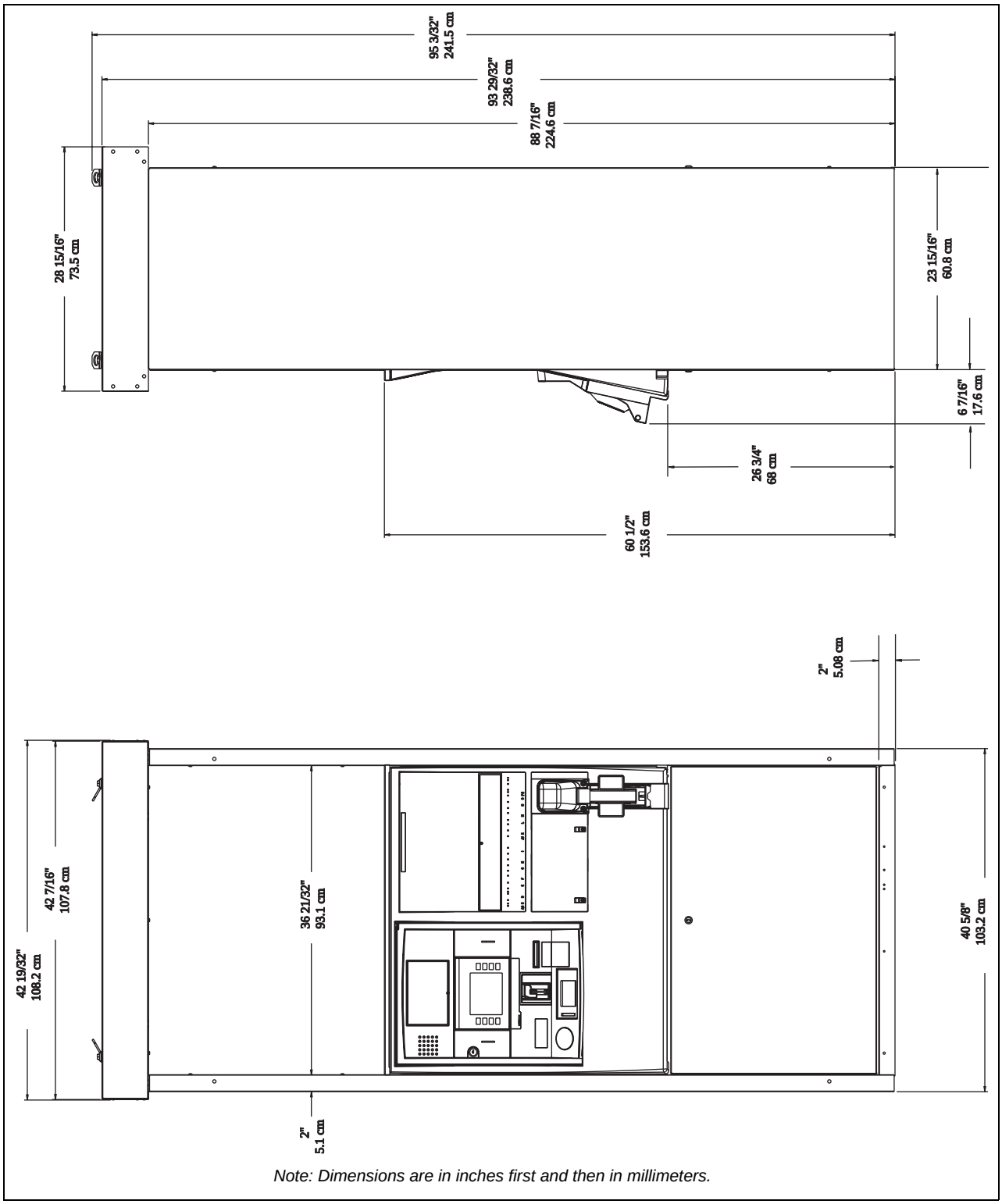
(Generally Used on Dispensers Only)

Note: For some locations, Shear Valves are required for pumps.

See PEI Publication RP100 Recommended Practices For Installation Of Underground Liquid Storage Systems (Chapter 9) and PEI Publication RP200 Recommended Practices For Installation Of Aboveground Storage Systems For Motor Vehicle Fueling. A shear valve (Figure 6-6 on page 44) is an NFPA 30A required safety device. It closes automatically to stop product flow during a fire or if the dispenser gets knocked off the island. It also provides a means of manually closing inlet pipes.

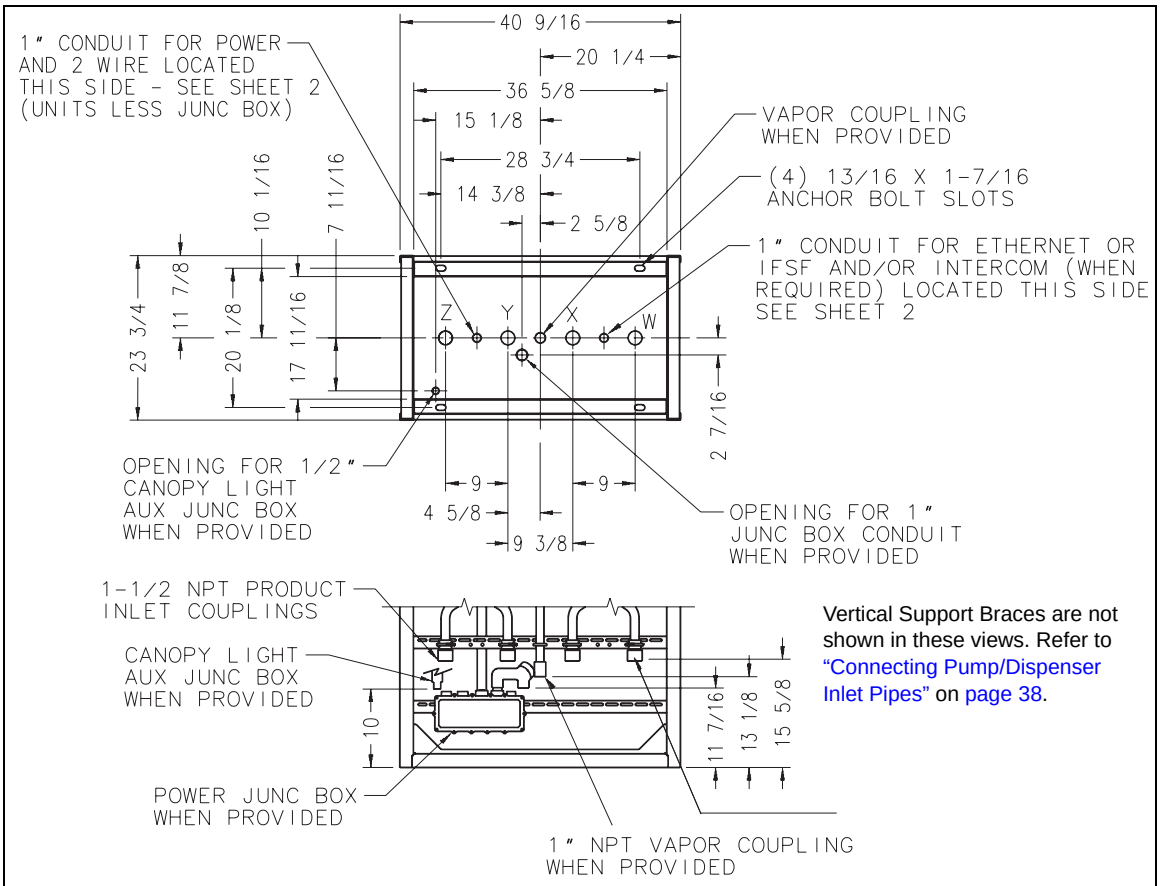
Appendix: Elevation and Foundation Diagrams

Figure A-1: Encore 300/500 Elevation Diagram



Note: Dimensions are in inches first and then in millimeters.

Figure A-2: Encore Foundation Diagrams: 1 of 7 (Encore 300/500 Dispensers)



Vertical Support Braces are not shown in these views. Refer to "Connecting Pump/Dispenser Inlet Pipes" on page 38.

INLETS	MODEL#	DISPENSER MODELS	
W	NA0	1 GRADE 2 HOSE	
W & X	NA1 NN0-3 NJ0 NG4	2 GRADE 4 HOSE X+0 SELECTABLE BLENDER 3 GR MULTI HOSE BLENDER 2 GRADE SINGLE HOSE	
W,X & Y	NA2 NG0 NL0-3 NJ2	3 GRADE 6 HOSE 3 GRADE SINGLE HOSE X+1 SELECTABLE BLENDER 3+1 MULTI HOSE BLENDER	2
W,X,Y & Z	NA3 NG1	4 GRADE 8 HOSE 3+1 SINGLE HOSE	3

NOTES:

1. MAXIMUM FIELD RETROFIT RAIN LIP SIZE WITHOUT REQUIRING ADAPTER PLATE: 17-1/2 X 39-1/2 X 2"

2. FOR X + 1 SELECTABLE BLENDER AND 3 + 1 MULTI HOSE BLENDER, INLET "Y" IS THE PLUS GRADE.

3. FOR 3 + 1 SINGLE HOSE, INLET "Z" IS THE PLUS GRADE.

Note: Dimensions are in inches.

Figure A-3: Encore Foundation Diagrams: 2 of 7 (Encore 300/500 Series Dispensers)

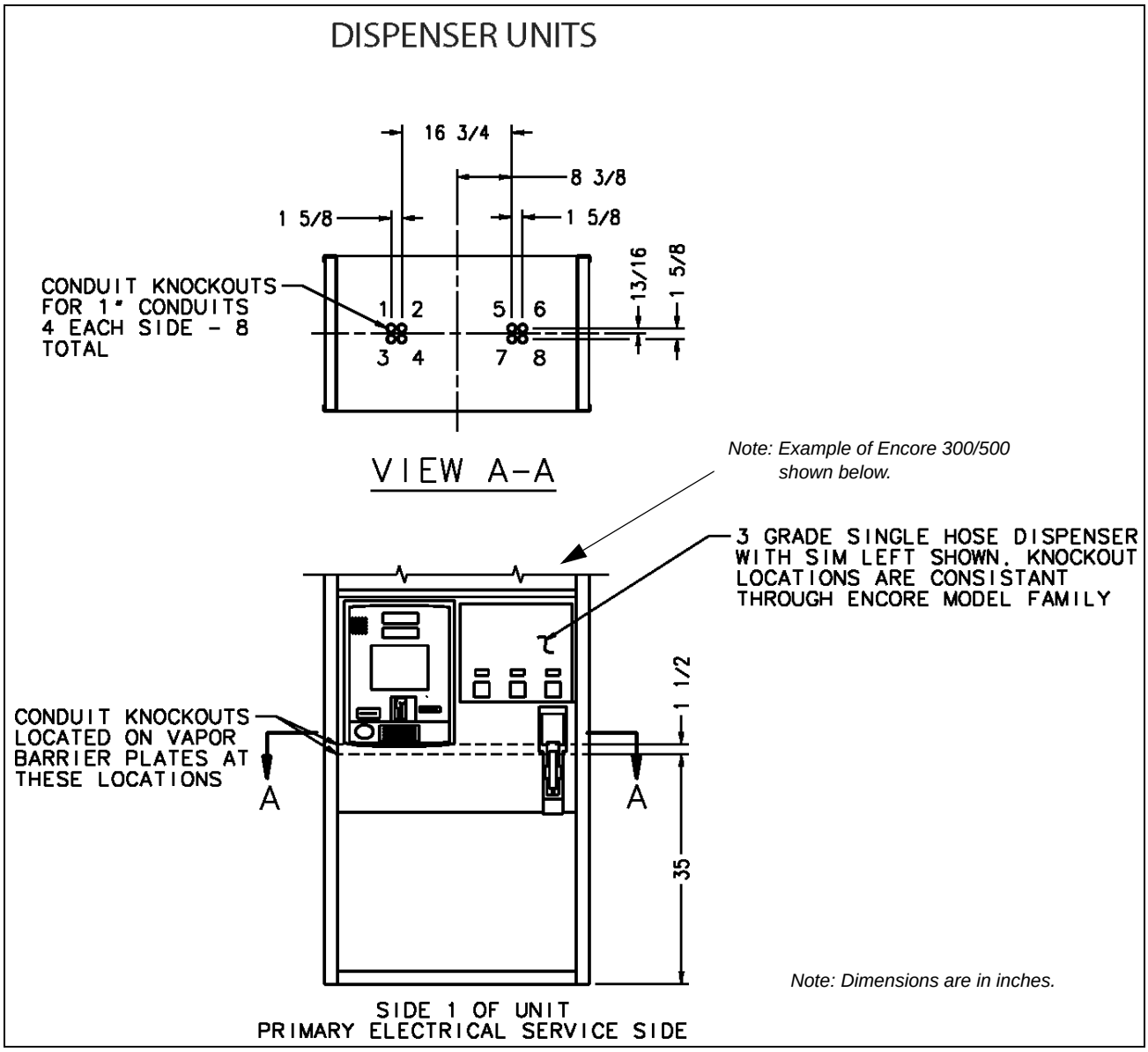
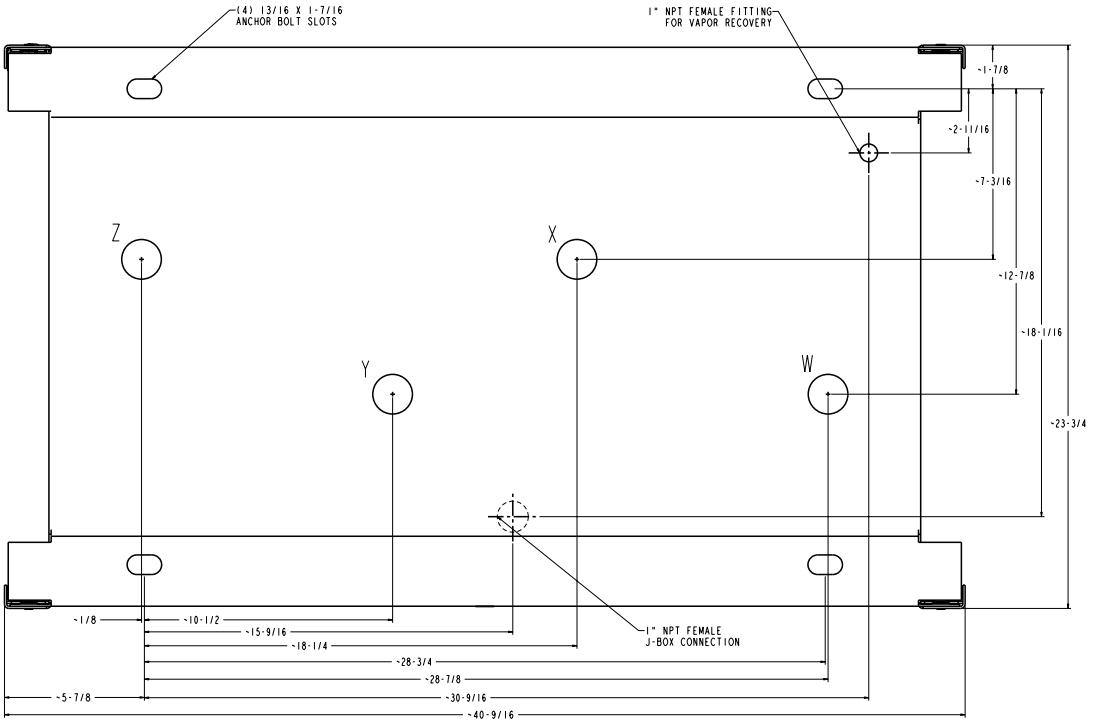
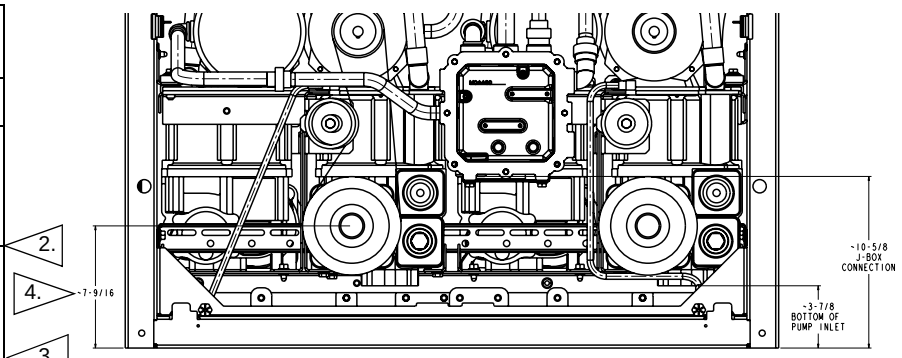


Figure A-4: Encore Foundation Diagrams: 3 of 7 (Encore 300/500 Pumps)



Inlets	Pumping Models
W	1-grade 2-hose
W and X	2-grade 4-hose X+0 Selectable Blender 3-grade Multi-hose Blender
W, X and Y	3-grade 6-hose 3-grade Single-hose X+1 Selectable Blender 3+1 Multi-hose Blender
W, X, Y and Z	4-grade 8 Hose 3+1 Single-hose

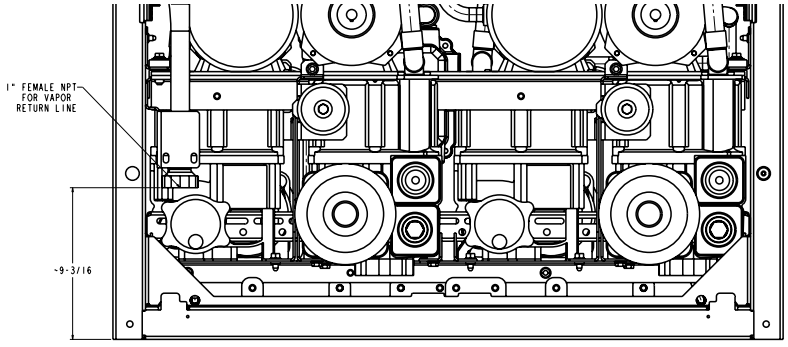


Side 1

Primary Electrical Service Side

Notes:

1. *Maximum field retrofit rain lip size without requiring adapter plate: 17-1/2 x 39-1/2 x 2"*
2. *For X+1 Selectable Blender and 3+1 Multi-hose Blender, Inlet "Y" is the Plus Grade.*
3. *For 3+1 Single Hose, Inlet "Z" is the Plus Grade.*
4. *Lift is determined by combining vertical distance from unit base to center line of pump shaft and unit base to tank bottom.*

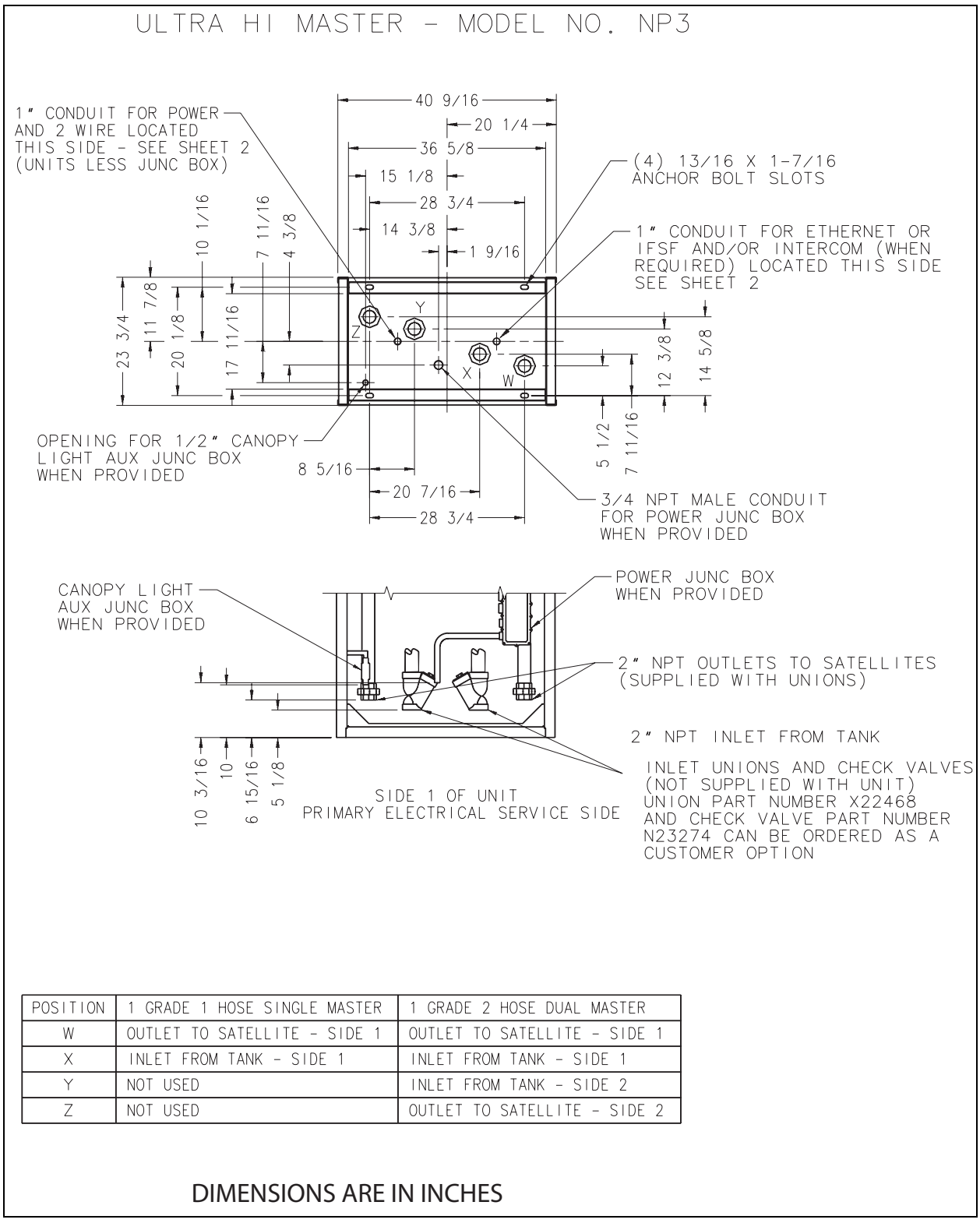


Side 2

Vertical support braces are not shown in these views.

Note: Dimensions are in inches.

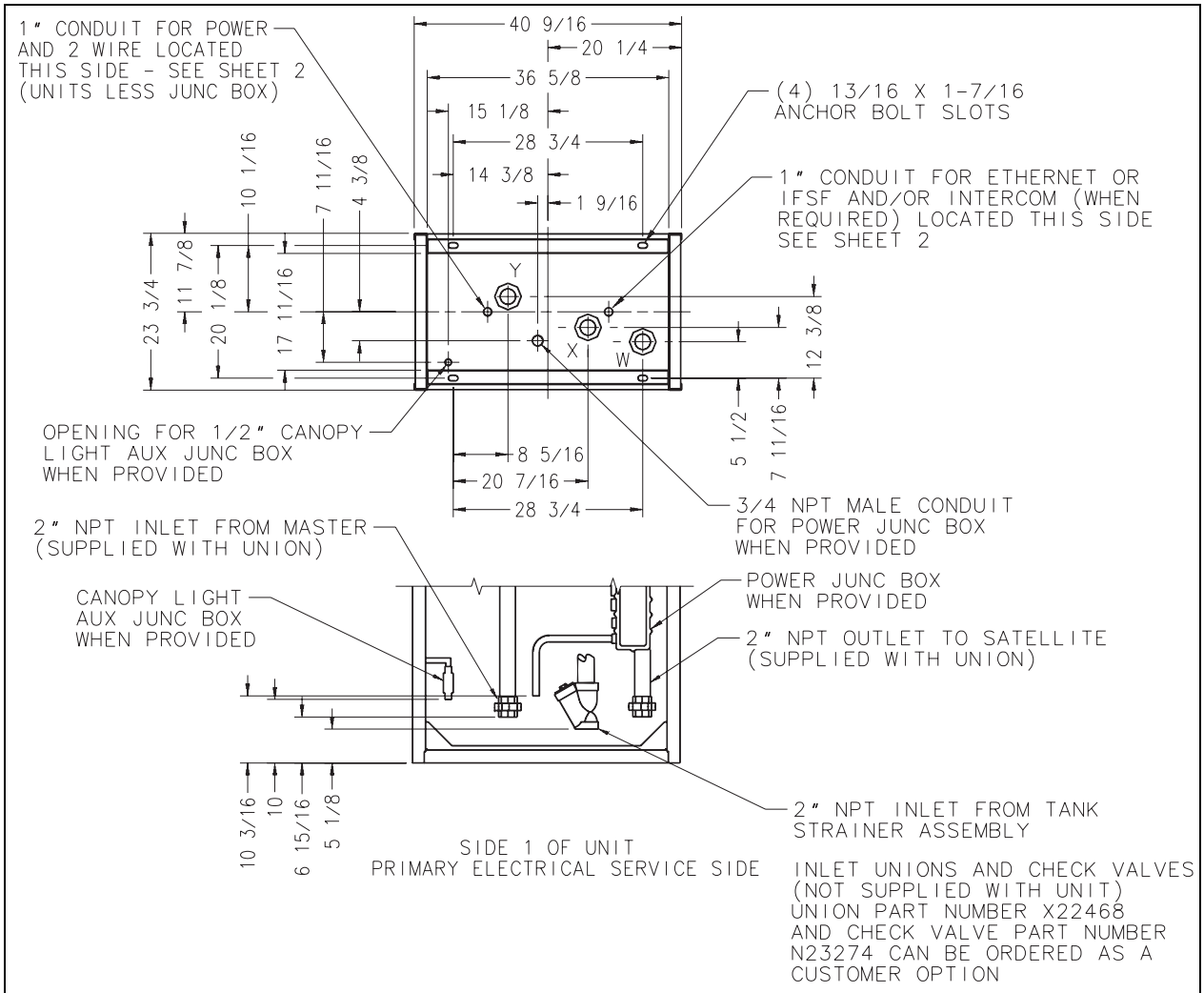
Figure A-5: Encore Foundation Diagrams: 4 of 7 (Encore Ultra-Hi NP3 and NP6)


ULTRA HI MASTER - MODEL NO. NP3
1" CONDUIT FOR POWER AND 2 WIRE LOCATED THIS SIDE - SEE SHEET 2 (UNITS LESS JUNC BOX)
40 9/16
20 1/4
36 5/8
15 1/8
28 3/4
14 3/8
1 9/16
(4) 13/16 X 1-7/16 ANCHOR BOLT SLOTS
1" CONDUIT FOR ETHERNET OR IFSF AND/OR INTERCOM (WHEN REQUIRED) LOCATED THIS SIDE SEE SHEET 2
10 1/16
7 11/16
4 3/8
23 3/4
11 7/8
20 1/8
17 11/16
Y
Z
X
W
12 3/8
14 5/8
5 1/2
7 11/16
OPENING FOR 1/2" CANOPY LIGHT AUX JUNC BOX WHEN PROVIDED
8 5/16
20 7/16
28 3/4
3/4 NPT MALE CONDUIT FOR POWER JUNC BOX WHEN PROVIDED
CANOPY LIGHT AUX JUNC BOX WHEN PROVIDED
POWER JUNC BOX WHEN PROVIDED
2" NPT OUTLETS TO SATELLITES (SUPPLIED WITH UNIONS)
2" NPT INLET FROM TANK
INLET UNIONS AND CHECK VALVES (NOT SUPPLIED WITH UNIT) UNION PART NUMBER X22468 AND CHECK VALVE PART NUMBER N23274 CAN BE ORDERED AS A CUSTOMER OPTION
10 3/16
10
6 15/16
5 1/8
SIDE 1 OF UNIT
PRIMARY ELECTRICAL SERVICE SIDE

POSITION	1 GRADE 1 HOSE SINGLE MASTER	1 GRADE 2 HOSE DUAL MASTER
W	OUTLET TO SATELLITE - SIDE 1	OUTLET TO SATELLITE - SIDE 1
X	INLET FROM TANK - SIDE 1	INLET FROM TANK - SIDE 1
Y	NOT USED	INLET FROM TANK - SIDE 2
Z	NOT USED	OUTLET TO SATELLITE - SIDE 2

DIMENSIONS ARE IN INCHES

Figure A-6: Encore Foundation Diagrams: 5 of 7 (Encore Ultra-Hi NP4)


1" CONDUIT FOR POWER AND 2 WIRE LOCATED THIS SIDE - SEE SHEET 2 (UNITS LESS JUNC BOX)
40 9/16
20 1/4
36 5/8
15 1/8
28 3/4
14 3/8
1 9/16
(4) 13/16 X 1-7/16 ANCHOR BOLT SLOTS
1" CONDUIT FOR ETHERNET OR IFSF AND/OR INTERCOM (WHEN REQUIRED) LOCATED THIS SIDE SEE SHEET 2
10 1/16
7 11/16
4 3/8
23 3/4
11 7/8
20 1/8
17 11/16
Y
X
W
12 3/8
5 1/2
7 11/16
OPENING FOR 1/2" CANOPY LIGHT AUX JUNC BOX WHEN PROVIDED
8 5/16
20 7/16
28 3/4
3/4 NPT MALE CONDUIT FOR POWER JUNC BOX WHEN PROVIDED
2" NPT INLET FROM MASTER (SUPPLIED WITH UNION)
CANOPY LIGHT AUX JUNC BOX WHEN PROVIDED
POWER JUNC BOX WHEN PROVIDED
2" NPT OUTLET TO SATELLITE (SUPPLIED WITH UNION)
10 3/16
10
6 15/16
5 1/8
2" NPT INLET FROM TANK STRAINER ASSEMBLY
SIDE 1 OF UNIT
PRIMARY ELECTRICAL SERVICE SIDE
INLET UNIONS AND CHECK VALVES (NOT SUPPLIED WITH UNIT) UNION PART NUMBER X22468 AND CHECK VALVE PART NUMBER N23274 CAN BE ORDERED AS A CUSTOMER OPTION

POSITION	MASTER/SATELLITE COMBO
W	OUTLET TO SATELLITE - SIDE 1 - MASTER SIDE
X	INLET FROM TANK - SIDE 1 - MASTER SIDE
Y	INLET FROM MASTER - SIDE 2 - SATELLITE SIDE
Z	NOT USED

ULTRA HI COMBO - MODEL NO. NP4
DIMENSIONS ARE IN INCHES

Figure A-7: Encore Foundation Diagrams: 5 of 7 (Encore Ultra-Hi NP4 - Alternate)

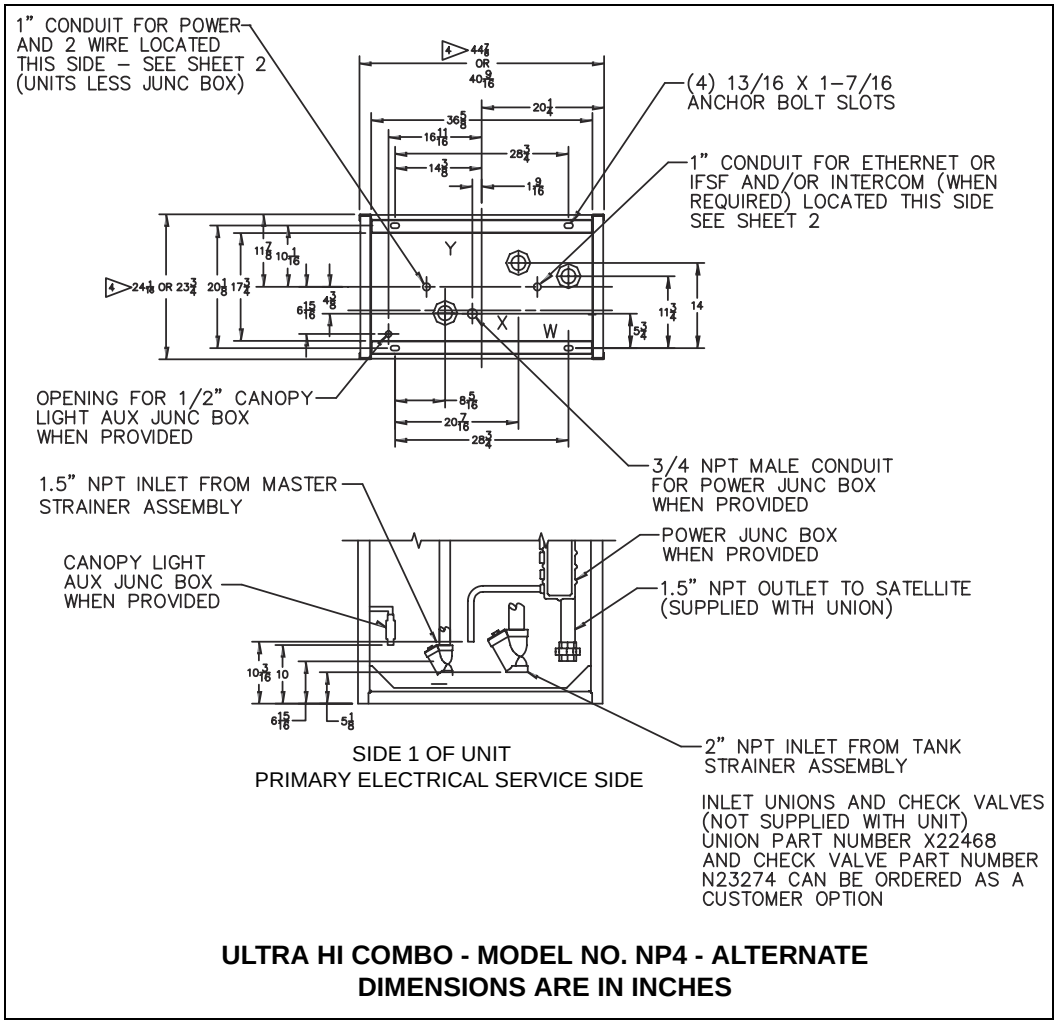
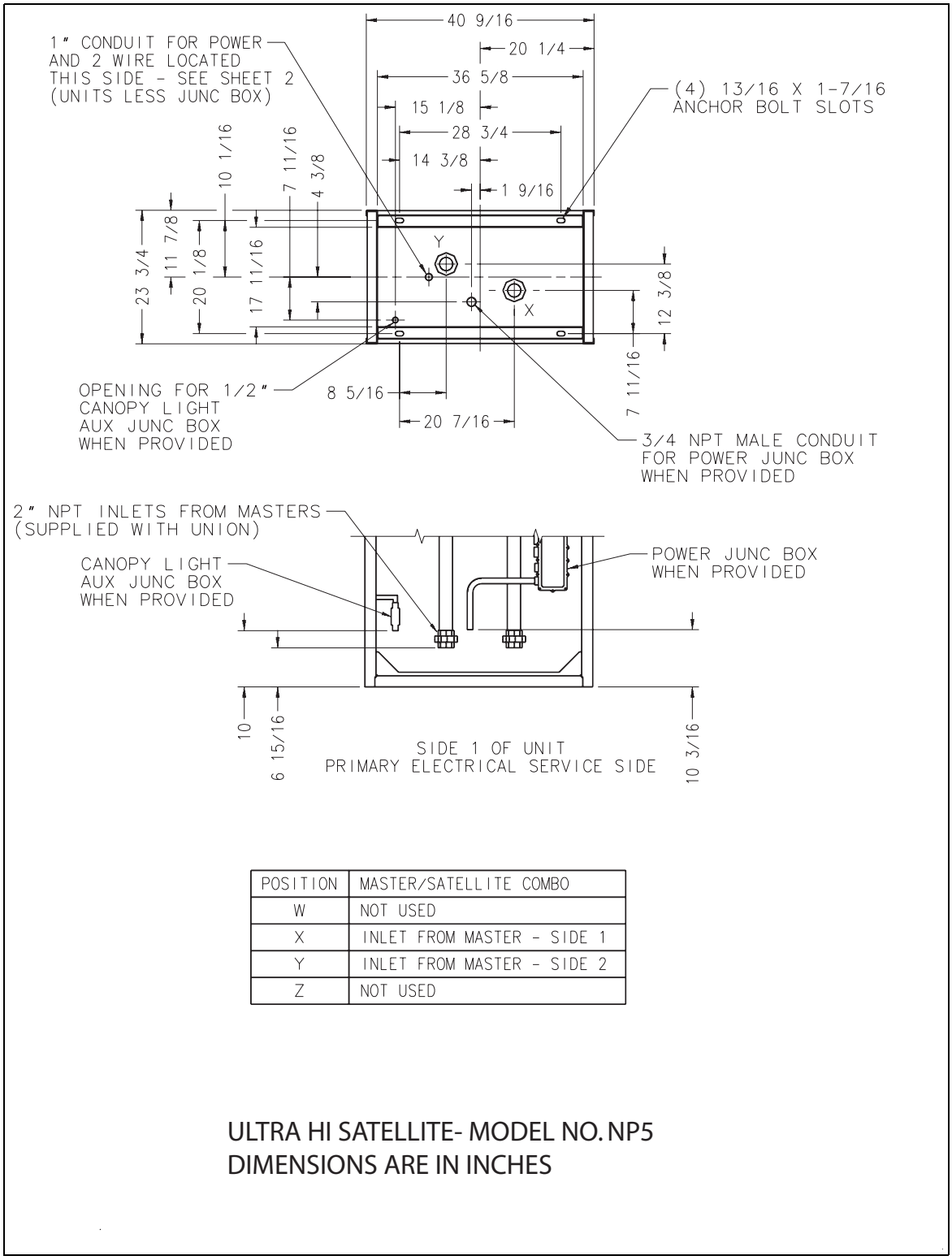

1" CONDUIT FOR POWER AND 2 WIRE LOCATED THIS SIDE – SEE SHEET 2 (UNITS LESS JUNC BOX)
(4) 13/16 X 1–7/16 ANCHOR BOLT SLOTS
1" CONDUIT FOR ETHERNET OR IFSF AND/OR INTERCOM (WHEN REQUIRED) LOCATED THIS SIDE SEE SHEET 2
OPENING FOR 1/2" CANOPY LIGHT AUX JUNC BOX WHEN PROVIDED
3/4 NPT MALE CONDUIT FOR POWER JUNC BOX WHEN PROVIDED
1.5" NPT INLET FROM MASTER STRAINER ASSEMBLY
POWER JUNC BOX WHEN PROVIDED
CANOPY LIGHT AUX JUNC BOX WHEN PROVIDED
1.5" NPT OUTLET TO SATELLITE (SUPPLIED WITH UNION)
2" NPT INLET FROM TANK STRAINER ASSEMBLY
SIDE 1 OF UNIT
PRIMARY ELECTRICAL SERVICE SIDE
INLET UNIONS AND CHECK VALVES (NOT SUPPLIED WITH UNIT) UNION PART NUMBER X22468 AND CHECK VALVE PART NUMBER N23274 CAN BE ORDERED AS A CUSTOMER OPTION
ULTRA HI COMBO - MODEL NO. NP4 - ALTERNATE
DIMENSIONS ARE IN INCHES

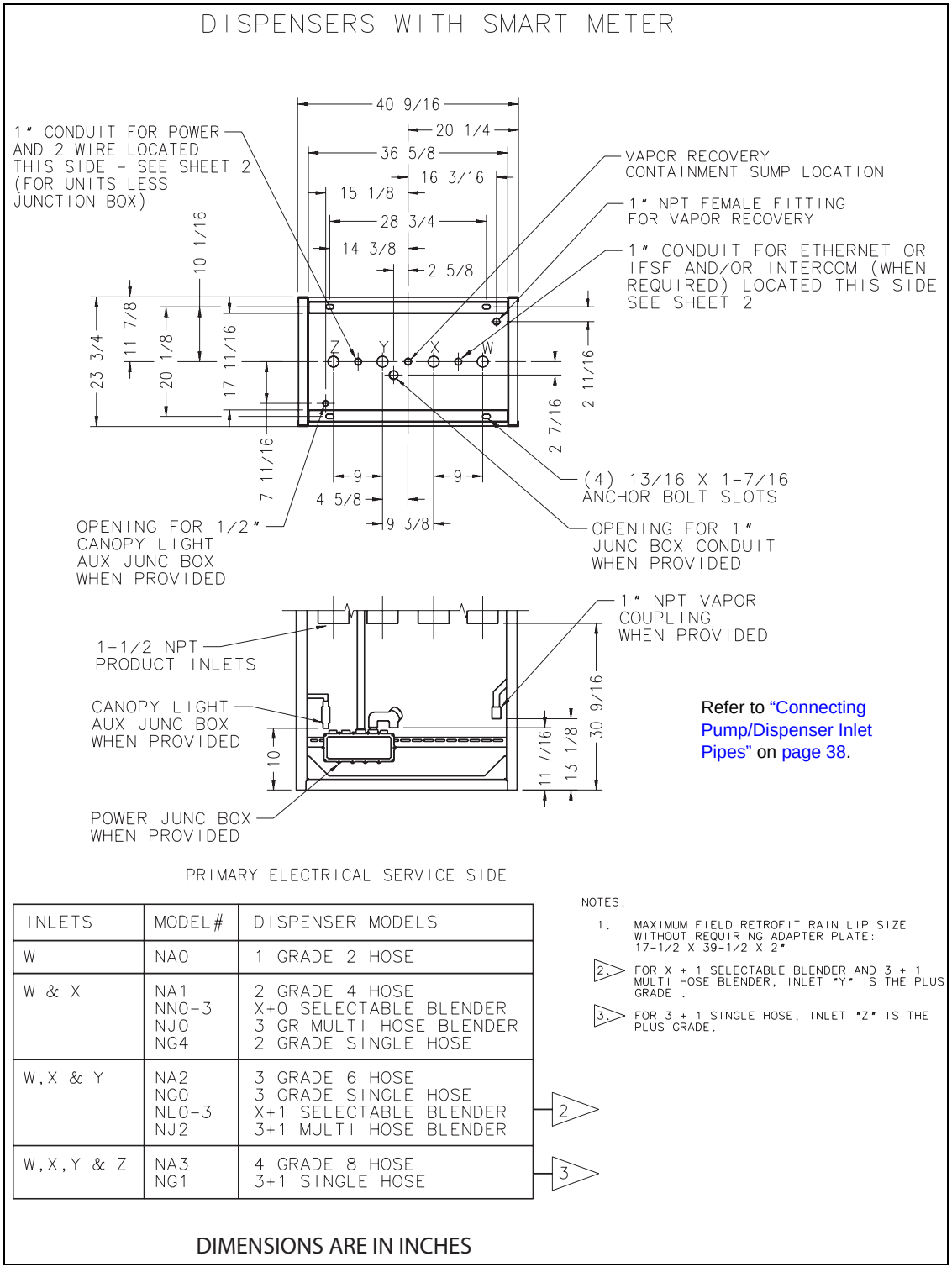
Figure A-8: Encore Foundation Diagrams: 6 of 7 (Encore Ultra-Hi NP5 and NP8)



POSITION	MASTER/SATELLITE COMBO
W	NOT USED
X	INLET FROM MASTER - SIDE 1
Y	INLET FROM MASTER - SIDE 2
Z	NOT USED

ULTRA HI SATELLITE- MODEL NO. NP5
DIMENSIONS ARE IN INCHES

Figure A-9: Encore Foundation Diagrams: 7 of 7 (Encore 550/500, 500 S Dispensers)



Refer to "Connecting Pump/Dispenser Inlet Pipes" on page 38.

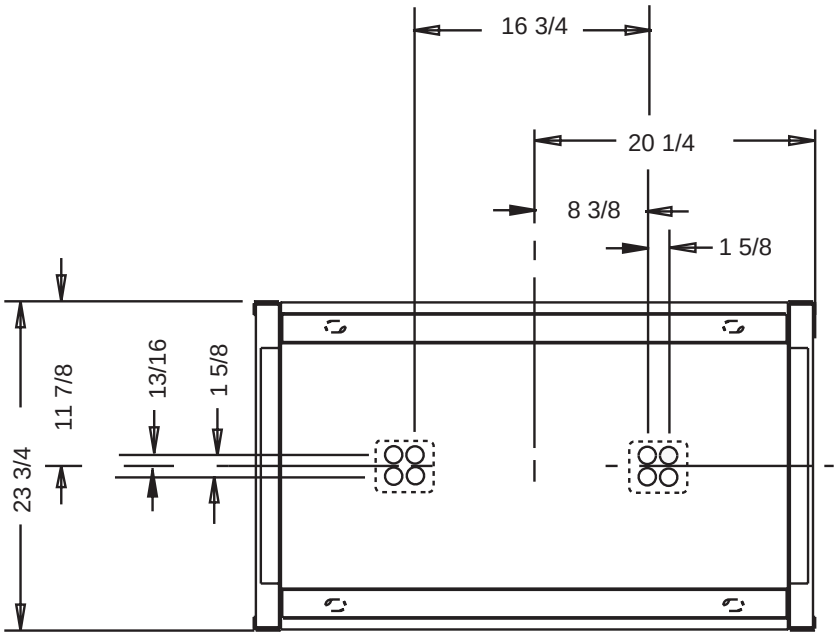
INLETS	MODEL#	DISPENSER MODELS
W	NA0	1 GRADE 2 HOSE
W & X	NA1 NN0-3 NJ0 NG4	2 GRADE 4 HOSE X+0 SELECTABLE BLENDER 3 GR MULTI HOSE BLENDER 2 GRADE SINGLE HOSE
W,X & Y	NA2 NG0 NL0-3 NJ2	3 GRADE 6 HOSE 3 GRADE SINGLE HOSE X+1 SELECTABLE BLENDER 3+1 MULTI HOSE BLENDER
W,X,Y & Z	NA3 NG1	4 GRADE 8 HOSE 3+1 SINGLE HOSE

NOTES:

1. MAXIMUM FIELD RETROFIT RAIN LIP SIZE WITHOUT REQUIRING ADAPTER PLATE: 17-1/2 X 39-1/2 X 2"
2. FOR X + 1 SELECTABLE BLENDER AND 3 + 1 MULTI HOSE BLENDER, INLET "Y" IS THE PLUS GRADE .
3. FOR 3 + 1 SINGLE HOSE, INLET "Z" IS THE PLUS GRADE.

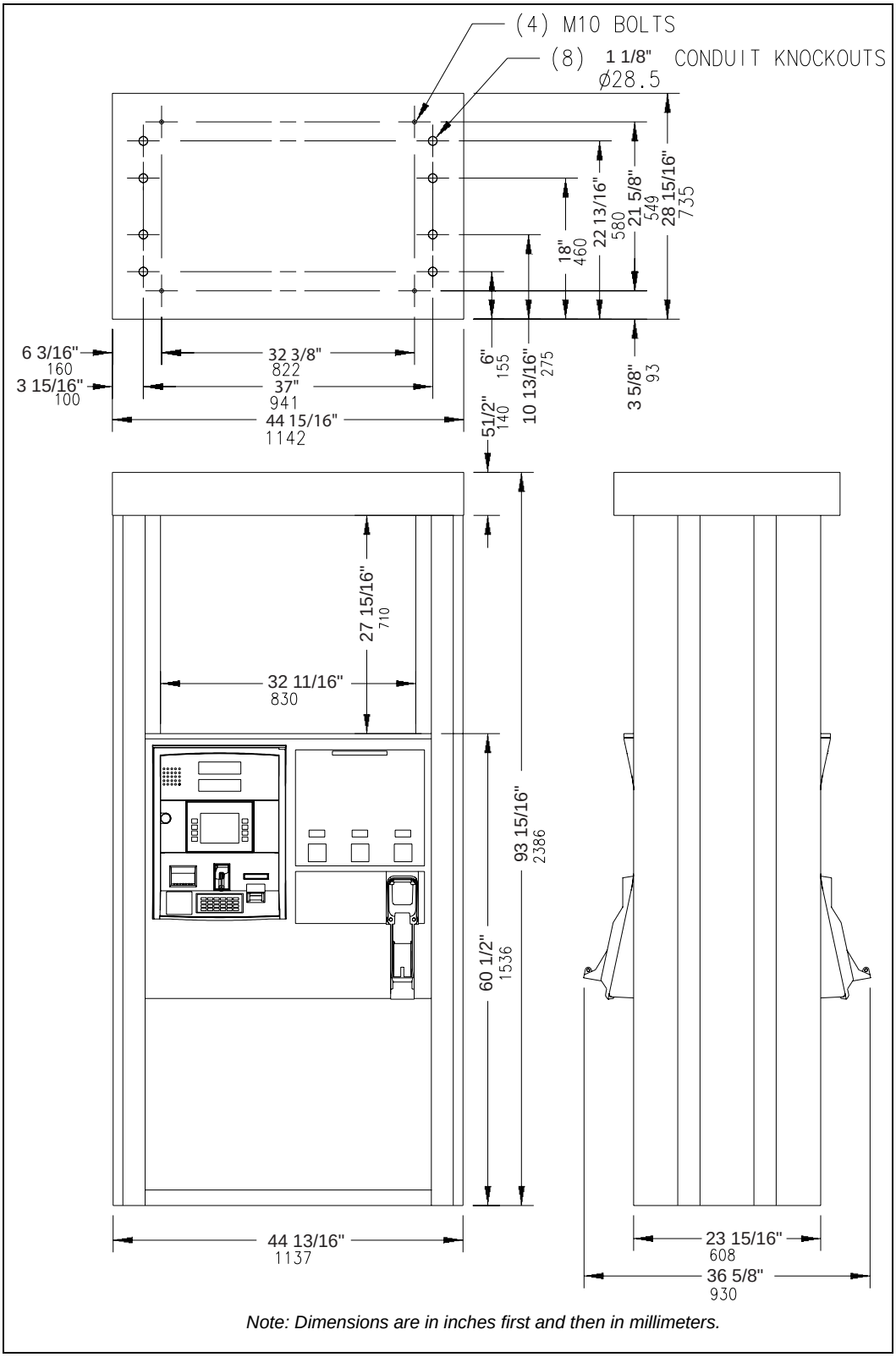
DIMENSIONS ARE IN INCHES

Figure A-10: Main Cabinet Conduit Knockouts



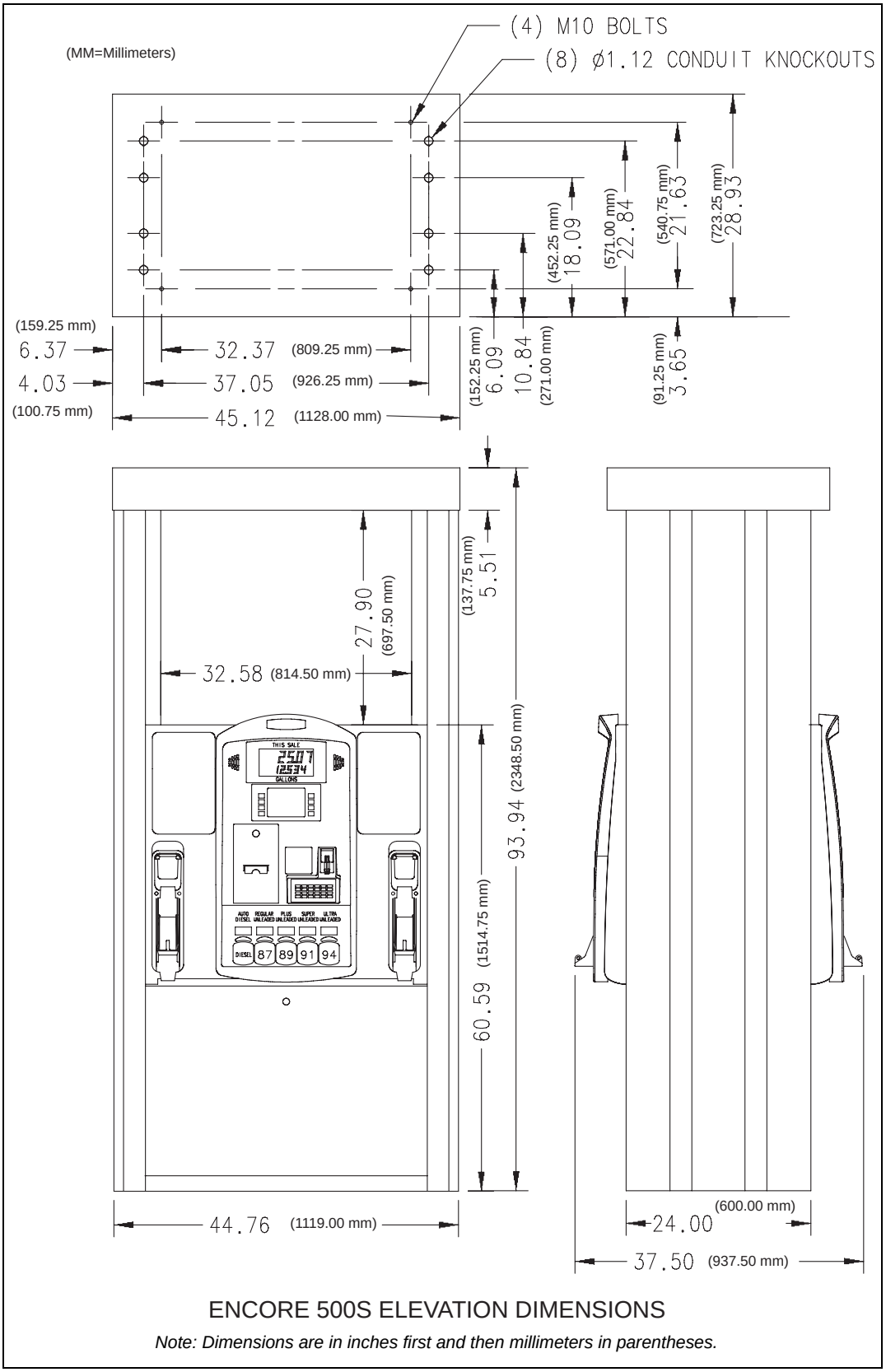
Notes: 1) Only two conduits per plate can be field installed at diagonal knockouts.
2) Not used for field connection for pumping units.
3) Dimensions are in inches.

Figure A-11: Encore Elevation Diagram (Encore 550 with SMART Meter)



Note: Dimensions are in inches first and then in millimeters.

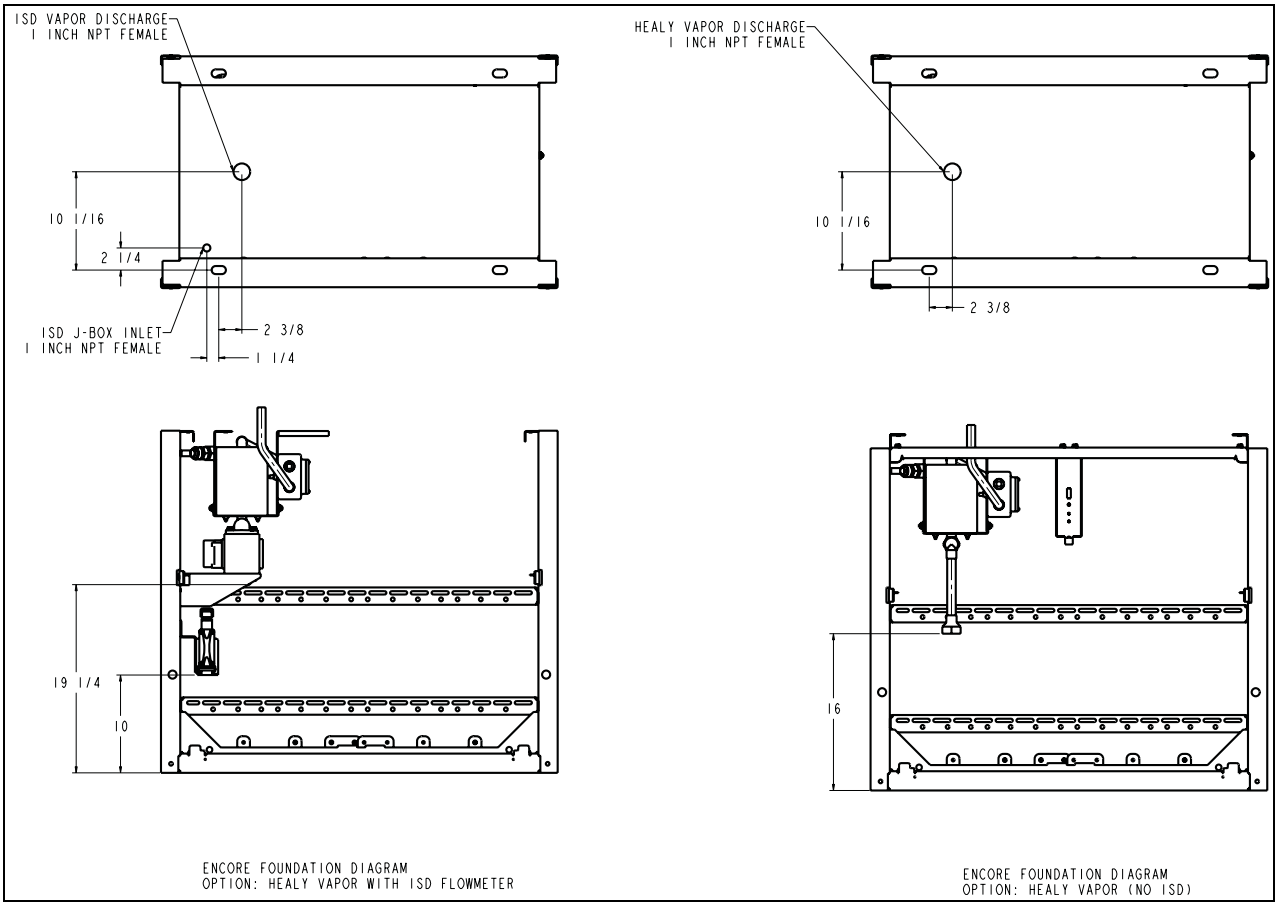
Figure A-12: Encore Elevation Diagram (Encore 500 S with SMART Meter)



ENCORE 500S ELEVATION DIMENSIONS

Note: Dimensions are in inches first and then millimeters in parentheses.

Figure A-13: Healy and In-station Diagnostic Option (Encore 300/500/500 S)



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